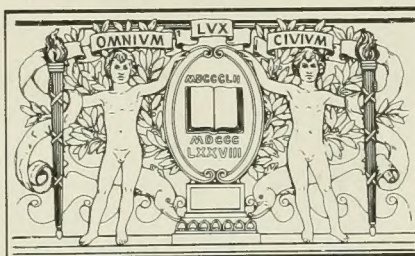
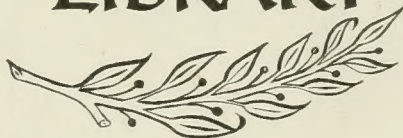


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SAE J1703b illustrates the approximate pressure buildup versus the master cylinder piston movement with the stroking fixture apparatus.) The pressure is relatively low during the first part of the stroke and then builds up smoothly to the maximum stroking pressure at the end of the stroke. The stroke length is about 23 mm (0.9 inch). This permits the primary cup to pass the compensating hole at a relatively low pressure. Using stroking fixtures, the WC piston travel is about  $2.5 \pm 0.25$  mm ( $0.100 \pm 0.010$  inch) when a pressure of 70 kg/sq cm is reached. Adjust the stroking rate to  $1,000 \pm 1,00$  strokes per hour. Record the fluid level in the master cylinder standpipe.

**S6.13.5 Procedure.** Operate the system for  $16,000 \pm 1,000$  cycles at  $23 \pm 5^\circ\text{C}$  ( $73.4 \pm 9^\circ\text{F}$ ). Repair any leakage, readjust the brake shoe clearances, and add fluid to the master cylinder standpipe to bring to the level originally recorded, if necessary. Start the test again and raise the temperature of the cabinet within  $6 \pm 2$  hours to  $120 \pm 5^\circ\text{C}$  ( $248 \pm 9^\circ\text{F}$ ). During the test observe operation of wheel cylinders for improper functioning and record the amount of fluid required to replenish any loss, at intervals of 24,000 strokes. Stop the test at the end of 85,000 total recorded strokes. These totals shall include the number of strokes during operation at  $23 \pm 5^\circ\text{C}$  ( $73.4 \pm 9^\circ\text{F}$ ) and the number of strokes required to bring the system to the operating temperature. Allow equipment to cool to room temperature. Examine the wheel cylinders for leakage. Stroke the assembly an additional 100 strokes, examine wheel cylinders for leakage and record volume loss of fluid. Within 16 hours after stopping the test, remove the master and wheel cylinders from the system, retaining the fluid in the cylinders by immediately capping or plugging the ports. Disassemble the cylinders, collecting the fluid from the master cylinder and wheel cylinders in a glass jar. When collecting the stroked fluid, remove all residue which has deposited on rubber and metal internal parts by rinsing and agitating such parts in the stroked fluid and using a soft brush to assure that all loose adhering sediment is collected. Clean SBR cups in ethanol (isopropanol when testing DOT 5 fluids)

and dry. Inspect the cups for stickiness, scuffing, blistering, cracking, chipping, and change in shape from original appearance. Within 1 hour after disassembly, measure the lip and base diameters of each cylinder cup by the procedures specified in S6.13.4(a) and (b) with the exception that lip or base diameters of cups may now differ by more than 0.08 mm (0.003 inch). Determine the hardness of each cup according to S7.4. Note any sludge or gel present in the test fluid. Within 1 hour after draining the cylinders, agitate the fluid in a glass jar to suspend and uniformly disperse sediment and transfer a 100 ml portion of this fluid to a centrifuge tube and determine percent sediment as described in S7.5. Allow the tube and fluid to stand for 24 hours, recentrifuge and record any additional sediment recovered. Inspect cylinder parts, note any gumming or any pitting on pistons and cylinder walls. Disregard staining or discoloration. Rub any deposits adhering to cylinder walls with a clean soft cloth wetted with ethanol to determine abrasiveness and removability. Clean cylinder parts in ethanol and dry. Measure and record diameters of pistons and cylinders according to S6.13.4(a) and (b). Repeat the test if mechanical failure occurs that may effect the evaluation of the brake fluid.

#### S6.13.6 Calculation.

(a) Calculate the changes in diameters of cylinders and pistons (see S5.1.13 (b)).

(b) Calculate the average decrease in hardness of the nine cups tested, as well as the individual values (see S5.1.13(c)).

(c) Calculate the increases in base diameters of the ten cups (see S5.1.13(e)).

(d) Calculate the lip diameter interference set for each of the ten cups by the following formula and average the ten values (see S5.1.13(f)).

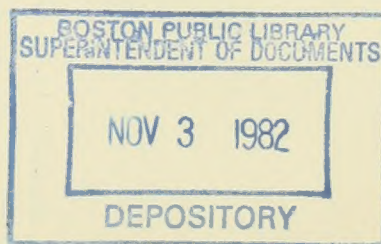
$$\frac{D_1 - D_2}{D_1 - D_3} \times 100 = \text{percentage Lip Diameter Interference Set}$$

Where:

$D_1$  = Original lip diameter

$D_2$  = Final lip diameter

$D_3$  = Original cylinder bore diameter





## S7. Auxiliary test methods and reagent standards.

**S7.1 Distilled water.** Non-referee reagent water as specified in ASTM D1193-70, "Standard Specifications for Reagent Water," or water of equal purity.

**S7.2 Water content of motor vehicle brake fluids.** Use analytical methods based on ASTM D1123-59, "Standard Method of Test for Water in Concentrated Engine Antifreezes by the Iodine Reagent Method," for determining the water content of brake fluids, or other methods of analysis yielding comparable results. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM-1 Compatibility Fluid within  $\pm 15$  percent of the water added for additions up to 0.8 percent by weight, and within  $\pm 5$  percent of the water added for additions greater than 0.8 percent by weight. The SAE RM-1 Compatibility Fluid used to prepare the samples must have an original ERBP of not less than  $182^{\circ}\text{C}$  ( $360^{\circ}\text{F}$ ) when tested in accordance with S6.1.

**S7.3 Ethanol.** 95 percent (190 proof) ethyl alcohol, USP or ACS, or Formula 3-A Specially Denatured Alcohol of the same concentration (see Part 212 of Title 26, Code of Federal Regulations—U.S. Treasury Department, I.R.S. Publication No. 368). For pre-test washings of equipment use approximately 90 percent ethyl alcohol, obtained by adding 5 parts of distilled water to 95 parts of ethanol.

**S7.4 Measuring the hardness of SBR brake cups.** Hardness measurements of SBR wheel cylinder cups and master cylinder primary cups shall be made by using the following apparatus and the following procedure.

### S7.4.1 Apparatus.

(a) *Anvil.* A rubber anvil having a flat circular top  $20 \pm 1\text{mm}$  ( $13/16 \pm 1/16$  inch) in diameter, a thickness of at least 9 mm ( $3/8$  inch) and a hardness within 5 IRHDs of the SBR test cup.

(b) *Hardness tester.* A hardness tester meeting the requirements for the standard instrument as described in ASTM D1415-68, "Standard Method of Test for International Hardness of Vulcanized Natural and Synthetic Rubbers," and graduated directly in IRHD units.

**S7.4.2 Procedure.** Make hardness measurements at  $23 \pm 2^{\circ}\text{C}$  ( $73.4 \pm 3.6^{\circ}\text{F}$ ). Equilibrate the tester and anvils at this temperature prior to use. Center brake cups lip side down on an anvil of appropriate hardness. Following the manufacturer's operating instructions for the hardness tester, make one measurement at each of four points one-fourth inch from the center of the cup and spaced 90 degrees apart. Average the four values, and round off to the nearest IRHD.

**S7.5 Sediment by centrifuging.** The amount of sediment in the test fluid shall be determined by the following procedure.

### S7.5.1 Apparatus.

(a) *Centrifuge tube.* Cone-shaped centrifuge tubes conforming to the dimensions given in Figure 6, and made of thoroughly annealed

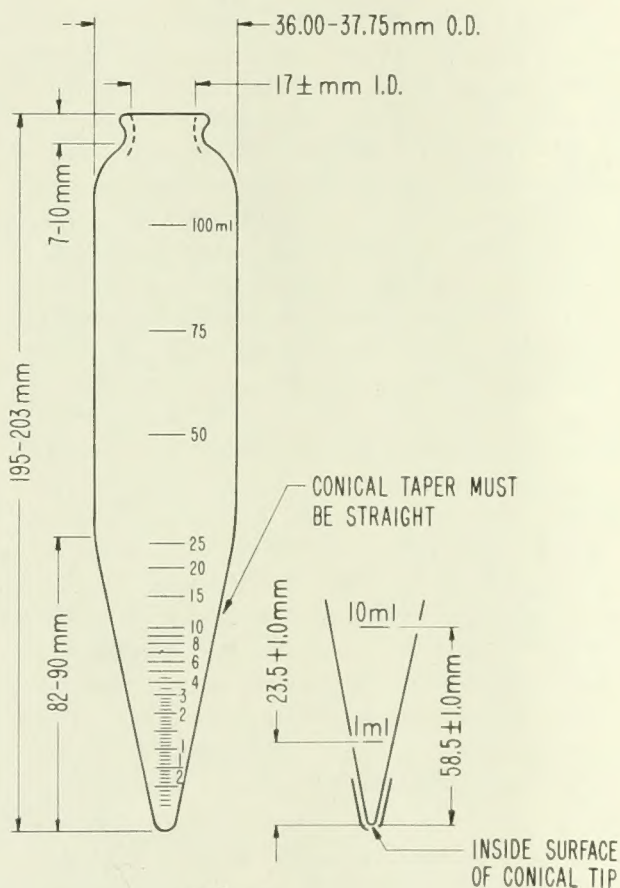


FIG. 6  
ASTM 8-in CENTRIFUGE TUBE



glass. The graduations shall be numbered as shown in Figure 6, and shall be clear and distinct. Scale-error tolerances and smallest graduations between various calibrations made with air-free water at 20°C (68°F).

TABLE V—CALIBRATION TOLERANCES  
FOR 8-inch CENTRIFUGE TUBE

Range, ml	Subdivision, ml	Volume Tolerance, ml
0 to 0.1	0.05	±0.02
Above 0.1 to 0.3	0.05	±0.03
Above 0.3 to 0.5	0.05	±0.05
Above 0.5 to 1.0	0.10	±0.05
Above 1.0 to 2.0	0.10	±0.10
Above 2.0 to 3.0	0.20	±0.10
Above 3.0 to 5.0	0.5	±0.20
Above 5.0 to 10.0	1.0	±0.50
Above 10. to 25.	5.0	±1.00
Above 25. to 100.	25.	±1.00

(b) *Centrifuge*. A centrifuge capable of whirling two or more filled centrifuge tubes at a speed which can be controlled to give a relative centrifugal force (rcf) between 600 and 700 at the tip of the tubes. The revolving head, trunnion rings, and trunnion cups, including the rubber cushion, shall withstand the maximum centrifugal force capable of being delivered by the power source. The trunnion cups and cushions shall firmly support the tubes when the centrifuge is in motion. Calculate the speed of the rotating head using this equation:

$$\text{rpm} = 265 \sqrt{\frac{\text{rcf}}{d}}$$

where: rcf = relative centrifugal force, and  
d = diameter of swing, in inches,  
measured between tips of opposite  
tubes when in rotating position.

Table VI shows the relationship between diameter, swing, relative centrifugal force (rcf), and revolutions per minute.

**S7.5.2 Procedure.** Balance the corked centrifuge tubes with their respective trunnion caps in pairs by eight on a scale, according to the centrifuge manufacturer's instructions, and place them on opposite sides of the centrifuge head. Use a dummy assembly when one sample is tested.

TABLE VI  
ROTATION SPEEDS FOR CENTRIFUGES  
OF VARIOUS DIAMETERS

Diameter of swing, inches <sup>a</sup>	Rpm at 600 rcf	Rpm at 700 rcf
19	1490	1610
20	1450	1570
21	1420	1530
22	1390	1500

<sup>a</sup> Measured in inches between tips of opposite tubes when in rotating position.

Then whirl them for 10 minutes, at a rate sufficient to produce a rcf between 600 and 700 at the tips of the whirling tubes. Repeat until the volume of sediment in each tube remains constant for three consecutive readings.

**S7.5.3 Calculation.** Read the volume of the solid sediment at the bottom of the centrifuge tube and report the percent sediment by volume. Where replicate determinations are specified, report the average value.

**S7.6 Standard styrene-butadiene rubber (SBR) brake cups.** SBR brake cups for testing motor vehicle brake fluids shall be manufactured using the following formulation:

#### FORMULATION OF RUBBER COMPOUND

Ingredient	Parts by Weight
SBR type 1503 <sup>a</sup>	100
Oil furnace black (NBS 378)	40
Zinc oxide (NBS 370)	5
Sulfur (NBS 371)	0.25
Stearic Acid (NBS 372)	1
n-tertiary butyl-2-benzothiazole sulfenamide (NBS 384)	1
Symmetrical-dibetanaphthyl - p - phenylenediamine	1.5
Dicumyl peroxide (40 percent on precipitated CaCO <sub>3</sub> ) <sup>b</sup>	4.5
<b>TOTAL</b>	<b>153.25</b>

NOTE: The ingredients labeled (NBS\_\_\_\_) must have properties identical with those supplied by the National Bureau of Standards

<sup>a</sup> Philprene 1503 has been found suitable.

<sup>b</sup> Use only within 90 days of manufacture and store at temperature below 27°C (80°F).



Compounding, vulcanization, physical properties, size of the finished cups, and other details shall be as specified in Appendix B of SAE J1703b. The cups shall be used in testing brake fluids either within 6 months from date of manufacture when stored at room temperature below 30° (86°F) or within 36 months from date of manufacture when stored at temperatures below minus 15°C (+5°F). After removal of cups from refrigeration they shall be conditioned base down

on a flat surface for at least 12 hours at room temperature in order to allow cups to reach their true configuration before measurement.

**S7.7 Isopropanol.** ACS or reagent grade.

**36 F.R. 11987**

**June 24, 1971**



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 117

### Retreaded Pneumatic Tires—Passenger Cars

(Docket No. 1-8)

Proposals to amend § 571.21 of Title 49, "Federal Motor Vehicle Safety Standards," to add a new standard on retreaded tires for use on passenger cars, were published October 14, 1967 (32 F.R. 14280), and March 5, 1970 (35 F.R. 4136). Prior to the latter notice, on April 10, 1969, a technical conference was held at which a discussion paper was offered for comments. Based upon this prior rulemaking activity, and after considering those comments received, a new motor vehicle safety standard is hereby issued that requires manufacturers of retreaded tires for passenger cars to comply with specified requirements.

The standard requires retreaded pneumatic tires for passenger cars to meet requirements for bead unseating, strength, endurance, and high speed performance identical to those specified for new pneumatic passenger car tires in Motor Vehicle Safety Standard No. 109, and to meet physical dimension and labeling requirements similar to the requirements of Standard No. 109. Many comments received in response to the notice of proposed rulemaking raised objections to these requirements. One objection was that the requirements make the retreader responsible for the performance of the casing as well as for his own retreading process. The casing is, however, one of the raw materials used in the retreading process. As such, the responsibility for the soundness of the casing can lie only with the retreader, as it is he who will determine that the casing is suitable for retreading purposes.

Some comments objected to the requirements because they believed them to be inappropriate for the retreaded tires. Their position was that Standard No. 109, in specifying requirements for new tires, took into account that new tires are designed to be used for more than one tread life.

Consequently, it is argued, it is unreasonable to subject a retreaded tire, whose casing has already undergone use through at least one tread life, to the same performance criteria as a new tire. The purpose of Standard No. 109, however, is to provide the public with passenger car tires that will perform safely under modern driving conditions. These conditions are the same whether a new tire or a retreaded tire is involved, and call for the same performance requirements, as far as is practicable. In agreement with this result is the position of certain parties who recommended that requirements for new and retreaded tires be identical. Their position was that retreaded tires must meet the same minimum performance requirements as new tires in order to prevent them from being considered as unsafe, or as less safe, than new tires.

Many comments particularly objected to the proposed requirement that retreaded tires must meet the same physical dimension requirements as new tires. It is recognized that tires may shrink during the retreading process. A dimensional requirement for retreaded tires is necessary, however, to ensure that retreaded tires labeled a certain size are within a specified maximum tolerance of the size. Consequently, as there may be difficulty in requiring retreaded tires to meet the same physical dimension requirements as new tires, the standard as issued requires that the section width and the overall width of retreaded tires not exceed by more than 10 percent the figure provided as the section width in Appendix A of Standard No. 109. This is a slight relaxation of the proposed requirement, which specified a 7-percent tolerance.

Several objections were also raised to the proposed requirements for tire casings. These pro-



posals were that casings used in retreaded tires not have bead wire or cord fabric exposed either before or during the retreading process, that they not have a belt or ply removed during retreading, and that casings contain the labels on them by the original tire manufacturer pursuant to Standard No. 109. Many comments objected to the prohibition of retreading on casings having exposed cord fabric either before or during processing. The argument was presented that cord fabric exposed during the buffing part of the retreading process can be and often is repaired without affecting the service life or safety of the retreaded tire. As an alternative, some comments suggested that this requirement be changed to require that cord fabric not be "damaged." Once cord fabric has been exposed, however, it is far more likely to have been worn, exposed to moisture, or damaged in some other way. Furthermore, the suggested language would be nearly impossible to enforce, as any determination of "damage" would be largely subjective. Requiring that the fabric not be exposed, however, is a far less subjective test, and is consequently less subject to error. The proposed requirement has accordingly been retained.

Objections were also raised to the requirement that would prohibit the removal of a belt from a tire casing during processing. The argument presented was that belt removal, and the addition or replacement of a belt as well, should be allowed if the finished tire can meet the specified requirements. The agency has concluded, however, that belt removal, addition, and replacement raise questions concerning compatibility of materials and tire performance for which no data is presently available. Until such time as information is available on the effects on tire performance of belt removal, addition, or replacement, these practices will be prohibited in the manufacture of retreaded tires.

The proposed rule would have required retreaded tires to be labeled with the same information required on new pneumatic tires by Standard No. 109. The preamble to the notice indicated that this provision, requiring all original labeling to be on the casing and to be retained through the retreading process, would be accompanied by

changes in the labeling requirements of Standard No. 109 that would require the original label to be placed in an area of the new tire sidewall where it would not be subject to destruction either during use or during retreading. As this amendment has not been made to Standard No. 109, the proposed labeling requirements are being modified. They require that each casing be one that has been labeled pursuant to S4.3 of Standard No. 109, but that the completed retreaded tire need only retain enough of the original label to display each item of required information in at least one location. The labeling requirements also provide that the retreaded tire be certified by labeling the tire with the symbol DOT, located on the tire as specified in Part 574, "Tire Identification and Record Keeping."

The notice of proposed rule making would have required retreaders to submit certain information to the agency, including a statement that records would be maintained by the retreader for a period of at least 3 years. These record keeping requirements involved records of materials used in the retreading process, records of process control, and records of performance tests and reported defects and failures. The purpose of these proposed requirements would have been to provide information to assist retreaders in ascertaining which tires might be suspect in the event of a finding of nonconformity or a safety-related defect. In consideration of comments received, the standard as now issued does not contain record keeping requirements, and record keeping by retreaders will be on a voluntary basis, consistently with the other standards. The NHTSA strongly recommends, however, that retreaders retain information on the materials and processes that they use, so that in the event of a defect or noncompliance they will be able to determine which tires are involved.

Similarly, the standard does not require retreaders to maintain records of performance tests or of reported defects and failures. Retreaders should be aware, however, that they are required to exercise due care in manufacturing retreaded tires to comply with this standard, and that information of this type is likely to be an important step in proving due care.



Effective date: January 1, 1972.

Issued on April 14, 1971.

In consideration of the foregoing, § 571.21 of Title 49, Code of Federal Regulations, is amended by adding a new motor vehicle safety standard, No. 117, "Retreaded Pneumatic Tires: Passenger Cars" as set forth below.

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Douglas W. Toms,  
Acting Administrator

**36 F.R. 7315**  
**April 17, 1971**







**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117****Retreaded Pneumatic Tires****(Docket No. 1-8)**

This notice is issued in response to petitions for reconsideration received concerning Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires," 49 CFR § 571.21, published April 17, 1971 (36 F.R. 7315).

Timely petitions were received from 8 parties; Bandag Incorporated, National Tire Dealers and Retreaders Association (by the firm of Sellers, Conner & Cuneo), The Mississippi Independent Tire Dealers Association, Alabama Tire Dealers and Retreaders Association, and The Louisiana Independent Tire Dealers Association, Owens-Corning Fiberglas Corp., American Retreaders Association, the Goodyear Tire and Rubber Company, the Rubber Manufacturers Association, and the B.F. Goodrich Tire Company. Certain other petitions were received more than thirty days after publication of the standard, and while they are petitions for rulemaking under the agency's procedural rules (49 CFR § 553.35) they have been considered in the issuance of this notice.

1. *Availability of casings.* Paragraph S5.2.3 of the standard requires that each retreaded tire be manufactured with a casing that has been labeled pursuant to S4.3 of Motor Vehicle Safety Standard No. 109. In effect, only casings from tires manufactured on or after August 1, 1968, have been required to have this information permanently labeled on the tire. According to many petitions, the period between August 1, 1968 and January 1, 1972, the standard's effective date, has been too short to allow the accumulation of a sufficient supply of casings that bear the required labeling. Many petitioners therefore requested that casings labeled pursuant to Standard No. 109 not be required until 1974 or 1975. These requests are denied. However, in order to make additional casings available the standard

has been amended to allow, between January 1, 1972 and January 1, 1974, the use of some casings labeled with specific fractional markings that were first introduced in 1965. These casings are those for use on wheels having diameters of 14 or 15 inches, marked with the size designations 6.45, 6.85, 6.95, 7.35, 7.75, 8.15, 8.25, 8.45, 8.55, 8.85, 8.90, 9.00, or 915, and labeled with certain information as a result of the "Tire Advertising and Labeling Guides" which were adopted by the Federal Trade Commission on July 5, 1966. In situations where these casings are used, the retreader is required to label them further, in a permanent manner, with a maximum load rating and maximum permissible inflation pressure obtained from a table incorporated into the standard. Casings that contain the specified information, together with the maximum load rating and maximum permissible inflation pressure added by retreaders, will be labeled with most of the information required on new tires by Standard No. 109, and in accordance with Section 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1421). Manufacturers who use these older casings should be aware, however, that retreaded tires manufactured with them must meet the same performance requirements as tires manufactured with casings that have been certified to be in compliance with Standard No. 109.

2. *Application of the DOT certification mark.* Paragraph S6 of the standard requires the manufacturer to certify each retreaded tire by affixing to the tire the symbol DOT, as provided in section 574.5 of the Tire Identification and Recordkeeping regulations. The Administration takes the position that affixing the DOT before the effective date of the standard is inconsistent with the intent of the National Traffic and Motor



Vehicle Safety Act, as it is only with respect to tires manufactured after the effective date that certification has legal significance. At the same time, under the Act all retreaded tires manufactured on or after January 1, 1972, must contain the DOT mark. Certain petitioners have indicated that it would be impossible, without a substantial disruption of business, for no tire to have a permanently affixed DOT symbol on or before December 31, 1971, and for all tires manufactured on January 1, 1972, and thereafter to have such a symbol. To remedy this problem the standard is being amended to allow the use of a paper label containing prescribed language to serve as a valid certification from January 1, 1972, through February 29, 1972.

3. *Retention of labeling.* Certain petitions requested that paragraph S6.2, which requires certain labeling on the casing to be retained, be amended because the labeling information sometimes appears in an area on the tire that is subject to buffing. Consequently, it is argued, it is impossible to retain the information through the retreading process. These requests are denied. The required labeling is essential to the appropriate use of the tire and varies from casing to casing. It has been determined that the most satisfactory way to ensure that correct information of this type appears on the completed tire is for the casing manufacturer's labeling to be retained. Casings that cannot be retreaded without destruction of the labeling will consequently be unsatisfactory for use.

4. *Casing with exposed cord.* Many petitioners objected to the requirements of paragraph S5.2.1 that prohibit the retreading of casings that have cord fabric exposed before or during processing. The argument presented is that such tires can be retreaded as effectively and will provide the same level of performance as tires manufactured from casings on which cord fabric is not exposed, as long as cords that are exposed are not damaged. These requests are denied.

The NHTSA recognizes that under optimum conditions, careful buffing that barely exposes, but does not touch, the tire cords can produce satisfactory results. In practice, however, tire buffing is often not done by precision methods or highly trained personnel, especially in the case

of smaller tire retraders. Any buffing that damages or removes part of the tire cords reduces the strength of the carcass at that point. Thus, buffing to the cord materially increases the possibility of producing unsafe tires.

Furthermore, exposing tire cords in the retreading process can cause the retreaded tire to be unsafe even if the cord is not damaged. In the manufacture of new tires, the cords that eventually make up the carcass are passed through complex adhesive solutions of resin and latex, before being dried and coated with rubber. Exposed cords in buffed retread carcasses generally do not receive comparable treatment to bond them to the overlaid rubber. Also, exposed carcass cords that are not promptly covered can absorb moisture from the air, which substantially weakens them.

Since the exposure of belts in belted tires does not carry with it the danger of impairment of carcass strength as does the exposure of ply cords, the standard is amended to make it clear that exposure of belt material during processing is allowed. Belt material may not, however, as specified in S5.2.1, be removed, added, or replaced. The petitions in this regard are denied for the reasons specified in the preamble to the standard published April 17, 1971.

5. *Physical dimension tolerances.* Several petitions noted that although retreaded tires may shrink during the retreading process, the physical dimension requirements of S5.1.2 allow only for a 10% tolerance over the maximum width to allow for service growth. An amendment to allow some shrinkage was requested. It has been determined that a minus 3% deviation from the specified section width is justified, and the standard is amended accordingly.

*Effective date:* January 1, 1972.

In the light of the above, Federal Motor Vehicle Safety Standard No. 117 in § 571.21 of Title 49, Code of Federal Regulations, is hereby amended. . . .

Issued on October 22, 1971.

Douglas W. Toms  
Administrator

36 F.R. 20877  
October 30, 1971



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117****Retreaded Pneumatic Tires****(Docket 1-8; Notice 5)**

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires" to increase the number of allowable casings that may be retreaded, to allow ply cord to be exposed in a limited, specified manner during the retreading process, and to modify the labeling requirements. Motor Vehicle Safety Standard No. 117 was issued April 17, 1971 (36 F.R. 7315), and amended, in response to petitions for reconsideration, on October 30, 1971 (36 F.R. 20877). Since that time certain segments of the industry have requested additional changes to the standard. This amendment is based on those requests.

1. One major objection that was raised concerns the prohibition against exposing cord in the ply area of the tire during processing. The issuance of April 17, 1971, prohibited any tire from being retreaded on which cord had been exposed either before or during the retreading process. The standard was further amended in the issuance of October 30, to allow belt material, but not ply cords, to be exposed during the retreading process.

The prohibition against retreading a casing that has exposed cord is based primarily on the fact that cord that has been exposed may have been damaged, thereby weakening the casing and increasing the chance that the completed tire will be unsafe. This is especially true where cord is exposed during the life of the original tire, as exposure of cord in this case will generally have been caused by excessive wear. However, cord has heretofore been exposed during the buffing part of many retreading processes, as a method of determining whether a sufficient amount of old tread rubber has been removed before the application of the new tread. The NHTSA recognizes the importance of removing a sufficient

amount of old tread, and that, as stated in the October 30 notice, "careful buffing that barely exposes, but does not touch, the tire cords can produce satisfactory results." The Administration retained the prohibition against buffing to the cord, except for belt material, on the basis of the finding that it could result in damage to the cord and create unsafe tires.

After reviewing additional information and arguments that have been presented by interested parties, the NHTSA has now determined that buffing to the ply cord in very limited circumstances can be allowed without incurring the risk that cords will be damaged during buffing. The amendment issued herewith allows buffing during the retreading process only at a splice, that is, where two segments of the same ply overlap. Exposure of cord at this point will not materially affect casing strength, as there still will be one layer of unexposed cord at the splice due to the ply overlap. Exposure of ply cord at a location other than a splice remains prohibited.

2. The standard as issued April 17, 1971, allowed only casings that had been labeled pursuant to Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109) to be used in the manufacture of retreaded tires. The categories of casings that could be retreaded under the standard were expanded in the amendment of October 30, 1971. Certain other additions, namely, the inclusion of certain 13-inch and 15-inch tire sizes and series 70 tires, each of which must contain certain labeling, are incorporated by this amendment.

3. In the preamble to the amendment of October 30, 1971, the NHTSA denied requests to amend the requirement that the original labeling on casings be retained on the completed retreaded tire, and that casings without retainable



labeling be discarded. The NHTSA's position was that retention of the original labeling was the most satisfactory way to ensure that each retreaded tire would be labeled with the appropriate safety information, and it was recognized that some casings would have to be rejected because of this requirement. Information which the agency has recently received, however, indicates that this requirement may reduce the number of retreadable casings to a degree not anticipated. The shortage of casings will result because the labeling on many casings lies in an area where it would be removed during the retreading process. Although the problem had been described in comments at previous stages of rulemaking, specific data as to the number of available casings was presented to the agency after the October 30 amendment.

The agency has concluded after review of this data that to require the discarding of casings without retainable labeling could substantially impair the industry due to a shortage of casings. The NHTSA has accordingly decided to revoke these requirements of the standard and to propose an alternate labeling scheme. A notice of proposed rulemaking to that effect is published in this issue of the *Federal Register*. Much of the difficulty experienced by retreaders in finding casings that bear labeling not subject to destruction results from the fact that many new tires carry their required information in locations such that it is removed during the retreading process. The NHTSA is therefore issuing an

additional notice of proposed rulemaking which would amend Standard No. 109 to require the labeling in question to be placed in an area where it will not be subject to destruction during the retreading process.

This amendment to Standard No. 117 does not change the requirement that only certain casings containing original labeling information be used in the manufacture of retreaded tires, but specifies that, at present, this labeling need not be retained on the completed tire.

In light of the above, section 571.117 of Title 49, Code of Federal Regulations (Motor Vehicle Safety Standard No. 117) is hereby amended. . . .

*Effective date:* January 1, 1972. The amendments issued herein relieve restrictions and impose no additional burdens on any person. Accordingly, it is found, for good cause shown, that an effective date less than 180 days, and less than 30 days, from the day of issuance is in the public interest.

This notice is issued pursuant to sections 103, 112, 113, 114, 119, and 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421) and the delegation of authority at 49 CFR 1.51.

Issued on December 21, 1971.

Douglas W. Toms  
Administrator

**36 F.R. 24814**  
**December 23, 1971**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

### Retreaded Pneumatic Tires

(Docket No. 1-8; Notice 7)

The purpose of this notice is to reissue, with certain amendments, Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires." Standard No. 117 was published April 17, 1971 (36 F.R. 7315). In response to petitions for reconsideration, the standard was amended October 30, 1971 (36 F.R. 20877). As a result of additional evidence which was presented to the agency regarding the requirements for labeling of retreaded tires and other issues, the standard was amended again on December 23, 1971 (36 F.R. 24814). On the same day a notice of proposed rulemaking was also published proposing new labeling requirements (36 F.R. 24825). This notice is issued both in response to two petitions for reconsideration concerning the amendment of December 23, and to incorporate amendments based on the notice of proposed rulemaking of December 23.

The issues raised by the two petitions, one from the National Tire Dealers and Retreaders Association and the other from the Rubber Manufacturers Association, concern the availability of casings, casing labeling, and the physical dimension requirements of the standard. Requirements for labeling retreaded tires, which are related to the requirements for casing labeling, are dealt with below in the discussion of the amendments that are based on the notice of proposed rulemaking.

*Availability of Casings.* The petitions requested that additional casing sizes, namely 5.20, 6.40, 7.50, 8.00, 8.20, 8.50, 8.85, 9.50, 145, 155, 165, 175, 185, 195, and 205 be added to the list of usable casings. The request that sizes 5.20, 6.40, 7.50, 8.00, 8.20, 8.50, and 9.50 be added is denied. One purpose of Standard No. 117 is to limit usable casings to those manufactured within a limited period before the effective date of the

standard. While these sizes were in fact manufactured during the period 1965-1967, unlike sizes presently allowed they were also manufactured in large numbers well before this period. It has not been demonstrated that these particular casing sizes are needed in order to ensure an adequate casing supply, and consequently they are not added to the list of usable casings. However, the remaining requested casing sizes, 8.85, 145, 155, 165, 175, 185, 195, and 205 are permitted to be used by this amendment as it appears that they were not in widespread use before the other sizes permitted to be used under the standard. In addition, the NHTSA has determined that some additional sizes, mostly radial sizes, may also be retreaded, and the proposed Table I has been amended accordingly and made part of the standard.

*Casing labeling.* As amended December 23, 1971, paragraph S5.2.4 of the standard required retreaded tires to be manufactured using casings that were either labeled in accordance with S4.3 of Standard No. 109, or until January 1, 1974, of certain enumerated sizes manufactured before the effective date of Standard 109. They were to be labeled with: (1) the generic name of the cord material used in the plies of the tire, (2) the actual number of plies, (3) the size of the tire, and (4) whether the tire is tubeless or tube type. The petitions have requested that casings not be required to contain this information.

The reason for requiring the casing, whether manufactured before or after the effective date of Standard 109, to contain the specified information is to provide information that retreaders can retain or carry over for the purpose of labeling retreaded tires. The only reliable source for much of this information is the casing.



The petitions have indicated, however, that not all of the information appears on many of the pre-Standard No. 109 casings, or appears in such a way that it cannot practicably be used for purposes of relabeling. The NHTSA has accordingly decided to modify the labeling requirements for pre-Standard No. 109 casings, and to make requirements for "DOT" casings consistent with them. As amended in this issuance, casings need only be labeled with (a) the tire's size designation, and (b) its actual number of plies or ply rating. Information obtained by NHTSA has indicated that almost all casing sizes allowed to be used by the standard had this information permanently labeled onto the tire sidewall.

The standard requires the casing to contain its original size marking. It also requires that the designated size of the retreaded tire be no larger (although it may be smaller) than the size of the original casing. Size is the chief criterion for consumers in the purchase of tires. The NHTSA has concluded that retreaded tires' sizes must be related to original casing markings in order to provide assurance that the correct size is placed on the retreaded tire, and that retreaders should not be allowed to determine casing size or the size of retreaded tires by any other means. Both petitions for reconsideration requested that this item of information not be required, and in this regard they are denied.

Casings are also required by this amendment to be labeled with either the tire's actual number of plies, or its ply rating. This modifies the proposed requirement that the "actual number of plies" appear. This information is also being required by today's amendment to appear on the retreaded tire. Ply rating is the basic criterion for determining the tire's maximum permissible inflation pressure and its maximum load. It is required to be on the casing because it cannot be determined with assurance except from the original tire marking. Some tires manufactured before the effective date of Standard No. 109 were not labeled with the actual number of plies, but of those that were not, almost all contained the ply rating. Consequently, requiring either actual number of plies or ply rating to be on casings will not reduce significantly the number of otherwise retreadable casings, and insofar as

the petitions requested complete deletion of this requirement, they are denied.

The standard is amended as requested by the petitions to eliminate the requirement that the generic name of the cord material, and whether the tire is tubeless or tube-type, appear on the casing. It appears that industry practice before the effective date of Standard No. 109 varied in the manner that information of this type was labeled on new tires, and that requiring the information to be on the casing would unnecessarily restrict the types of usable casings.

Mention was made in the petitions of the possibility of information appearing on new tires being rubbed off in service, making casing labeling requirements difficult to meet. The NHTSA is of the opinion that, while this is a possible occurrence, complete obliteration of the labeling is unlikely. More important, however, is the fact that casings where the labeling does not appear should not, from a safety standpoint, be retreaded. The NHTSA has concluded that despite any consequent reduction in the number of casings, retreaders should not be left to their own devices in determining casing size and ply rating on completed tires, but that such information, for the safety of consumers, must be based on the casing's original markings.

*Physical dimension requirements.* The petitions have asked that the physical dimension requirements be amended to allow for a 3 percent minus deviation from the minimum size factor specified for the tire's size designation and type. The standard presently allows a plus 10 percent, and minus 3 percent deviation from the maximum section width only. The requests are based on the tendency of certain retreaded tires to shrink temporarily as a result of the retreading process.

These requests are denied. Data obtained from NHTSA tests indicate that the present requirements are being met, and that further relief is unnecessary. However, as a result of a comment received, paragraph S5.1.2 is being rewritten for purposes of clarity.

*Labeling.* The notice of proposed rulemaking published December 23, 1971 (36 F.R. 24825), specified a system by which retreaded tires would be required to be labeled with certain safety



information. The use of an affixed label would be allowed for a limited period following the standard's effective date, but after that period the information would be required to be permanently molded into or onto the tire sidewall. The final rule issued today adopts this system, with certain modifications in the information to be provided, resulting from the amendments to paragraph S5.2.4. The information is the same for both affixed and molded labeling, and consists of (a) the tire's size designation, (b) its maximum permissible inflation pressure, (c) its maximum load, (d) the actual number of plies, ply rating, or both, (e) the words "tubeless" or "tube type" as applicable, (f) the words "bias/belted" if the tire is of bias-belted construction, and (g) the word "radial" if the tire is of radial construction.

Size, maximum load, and maximum permissible inflation pressure are required because each is necessary for proper selection and use of passenger car tires. While the standard requires the size to be based on the original casing size, the values for maximum load and inflation pressure may, where necessary, be based on a table incorporated into the standard. The values in the table are based on the values for the tire's size designation and type as they appear in Standard No. 109 (§ 571.109), and are determined according to the tire's size and ply rating, both of which are required to be on the casing.

The words "bias/belted" and "radial" are required, where appropriate, in order to identify tires of different types of construction. There is presently a large body of opinion, supported by NHTSA, that mixing tires of differing construction types on the same vehicle or same axle of a vehicle is not in the best interests of safety. In the case of the requirement that the words "bias/belted" appear, while not proposed in the notice of December 23, the information would have been available if the proposed language, "actual number of plies in the sidewall and the actual number of plies in the tread area, if different," had been retained. The NHTSA does not believe labeling the words "bias/belted" will present significant problems for retreaders as most belted tires were manufactured after the effective date of Standard No. 109, and are consequently identified as such. Those that were

not usually contained some similar identification. Moreover, it appears that after proper buffing, belted tires exhibit visible differences from pure bias construction.

The word "radial" is also being required, despite the fact that as proposed it would not have been required until permanent markings were required. At the time of the proposal, however, NHTSA was not aware that radial tires were being retreaded. It appears now that they are, and in the interests of safety the term "radial" is required to be added to all retreaded radial tires.

The words "tubeless" or "tube type" are also required to be labeled onto completed retreaded tires. Almost all of the comments considered this information to be safety related. Even though not required to appear on the casing, the information will be available to retreaders, as (1) most tubeless casings were in fact so marked, and (2) a tube-type tire, in most cases, can be identified by the lack of inner lining that is present on tubeless tires. In those cases where identification is not possible, the casing should not be retreaded, as this information would likewise be unknown at time of sale.

The proposed requirement that the tire be labeled with the generic name of its cord material is not retained. The comments have argued, and NHTSA agrees, that in the case of retreaded tires this information is not substantially related to safety. This, combined with the fact that it appears only on certain casings, where it must if it is to be relabeled, has convinced the NHTSA that at present the requirement should not be included in the standard.

Many comments opposed the requirement that labeling be molded into or onto the tire sidewall until such a time as new tire labeling was required to be placed in a position where it would not be buffed off during retreading, and could thus be retained through the retreading process. These comments argued that permanent labeling of this type proposed was unreasonably difficult to apply to retreaded tires because tires that would require different labeling are retreaded in the same matrix. This would require constant, time consuming changing of the matrix, and a resultant high possibility of error.

Tires, however, may be subject to many applications during their useful life. They are transferred from wheel to wheel, and from vehicle to vehicle, and each time this takes place the information on the tire sidewall becomes important. Permanent labeling is therefore required if the information is to perform its function, as it can be readily assumed that affixed labels will last little longer than the first time the tire is mounted. Affixed labels, as indicated in the preamble to the proposed rule of December 23, are to be permitted only because methods for permanent labeling are not immediately available to retreaders, and not as a viable substitute for permanent labeling. The NHTSA disagrees with industry claims that permanent labeling presents unreasonable technical problems. Methods for permanent labeling developed for compliance with the Tire Identification and Record-keeping Regulations (49 CFR Part 574) can be readily adapted to meet these requirements. In fact, of all the information required in today's amendment, only the "size" and "maximum load rating" will vary to a significant amount from casing to casing. Each of the other items of required information can be applied uniformly to large groups of casings and need not be changed from tire to tire if proper sorting is done before retreading occurs.

In light of the above, Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires,"

§ 571.117 of Title 49, Code of Federal Regulations, is revised . . . .

*Effective date:* The standard's effective date of January 1, 1972, has been stayed as a result of court litigation, which is still pending. The NHTSA does not expect manufacturers to maintain a state of constant preparation so as to be able to comply with the standard as of the time the stay, should the court so decide, is lifted. It has determined, therefore, that additional leadtime will be necessary. Accordingly, the provisions of the standard, except those regarding labeling, shall become effective 30 days from the day the stay is lifted. The labeling requirements requiring the use of affixed labels shall become effective 90 days from that date, and those for permanent labeling, approximately one year from that date. Notice of exact dates will be published in the *Federal Register* at the time the stay is lifted.

This notice is issued pursuant to the authority of sections 103, 112, 113, 114, 119 and 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. §§ 1392, 1401, 1403, 1407, 1421); and the delegation of authority at 49 CFR 1.51.

Issued on March 17, 1972.

Douglas W. Toms  
Administrator

37 F.R. 5950  
March 23, 1972



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117****Retreaded Pneumatic Tires**

(Docket 1-8; Notice 9)

This notice revokes high speed and endurance requirements in Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires," in accordance with an order of the United States Court of Appeals for the Seventh Circuit in *H & H Tire Company v. Volpe*, No. 71-1935, 7th Cir., December 5, 1972. It also specifies effective dates for provisions of the standard subject to a stay that was entered by the court on December 31, 1971, and removed by its order.

In a notice published March 23, 1972 (37 F.R. 9590), the NHTSA indicated that it did not believe retreaders should be required to maintain a state of constant preparation, so as to be able to conform to the standard immediately following the lifting of the stay by the reviewing court. The NHTSA took this position although the stay had been imposed only 24 hours before the standard was to become effective, and retreaders should have by that time taken all necessary steps to achieve compliance. The notice accordingly specified that those requirements of the standard dealing with matters other than labeling would become effective approximately 30 days after the stay imposed by the court had been lifted. Requirements dealing with affixed labels (S6.3.1) were to become effective in 90 days, and requirements for permanent labeling (S6.3.2) in one year.

When these dates were projected, however, the NHTSA had assumed a decision would be rendered by the court in a short time. That assumption proved incorrect, and the NHTSA has determined that more leadtime than that specified on March 23, 1972, should be allowed. This leadtime will allow retreaders to use up their already acquired inventory of casings, and to obtain labels to conform to the affixed labeling requirements.

This notice provides, therefore, that provisions of the standard except those dealing with permanent labeling are effective 120 days from the day of publication. The permanent labeling requirements of the standard are effective one year from the day of publication. The NHTSA is of the opinion that 120 days is sufficient under the circumstances for retreaders to take whatever remaining steps are necessary to achieve conformity with these requirements.

In light of the above, Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires", 49 CFR 571.117, is amended. . . .

*Effective date:* June 1, 1973, except for the provisions of paragraph S6.3.2, which are effective on February 1, 1974. The requirements of this standard were originally issued April 17, 1971, to become effective January 1, 1972. The standard in its present form was published March 23, 1972, but did not take effect due to a stay imposed on December 31, 1971. Accordingly, adequate lead time has already been provided for any long-range steps necessary for compliance. The public was notified of expected effective dates by the notice of March 23, 1972.

It is therefore found, for good cause shown, that an effective date less than 180 days from the date of publication of this notice is in the public interest.

(Sec. 103, 112, 113, 114, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51)

Issued on January 24, 1973.

Douglas W. Toms  
Administrator

**38 F.R. 2982**  
**January 31, 1973**





# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117**

## **Retreaded Pneumatic Tires**

**(Docket No. 71-23; Notice 3)**

**(Docket No. 1-8; Notice 10)**

This notice amends Motor Vehicle Safety Standards Nos. 109 and 117 (49 CFR 571.109) to reduce the minimum size of permanent safety labeling to 0.078 inches. Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," was amended November 4, 1972 (37 F.R. 23536), to specify both a location on the tire sidewall for safety labeling and a labeling size of not less than  $\frac{3}{32}$  of an inch. Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires", was amended March 23, 1972 (37 F.R. 9590), to specify permanent labeling of the same minimum size.

The Michelin Tire Company has protested that the  $\frac{3}{32}$  inch minimum size is inconsistent with the existing practice of European tire manufacturers of labeling tires in letters having a size of 0.078 inches (2mm). It has pointed out that as a consequence of the amendment, European tire manufacturers will have to increase the size of all existing labeling. The NHTSA has concluded that the difference between letters 0.078 inches in size and those of 0.093 inches is not significant, and does not justify the resultant expense to manufacturers of modifying tire molds. By this notice the NHTSA therefore reduces the minimum size to 0.078 inches for labeling required by S4.3 of Standard No. 109.

Because the permanent labeling provisions of Standard No. 117 are intended to be ultimately met with new tire labeling, the size requirements for permanent labeling in that standard are also modified.

In light of the above, Motor Vehicle Safety Standard No. 109, 49 CFR 571.109, and Motor Vehicle Safety Standard No. 117, 49 CFR 571.117, are amended . . . .

Effective dates: July 1, 1973, for the amendment to S4.3 of 49 CFR 571.109; February 1, 1974, for the amendment to S6.3.2 of 49 CFR 571.117. These amendments relieve an unnecessary restriction without a significant effect on motor vehicle safety. Consequently, it is found for good cause that notice and public procedure thereon are unnecessary, and that an effective date less than 180 days from the day of issuance is in the public interest.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegations of authority at 49 CFR 1.51.)

Issued on March 8, 1973.

James E. Wilson  
Acting Administrator

**38 F.R. 6999**  
**March 15, 1973**





## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117**

### **Retreaded Pneumatic Tires**

**(Docket No. 1-8; Notice 11)**

This notice amends paragraph S6.2 of Standard No. 117, Retreaded Pneumatic Tires (49 CFR 571.117), to allow the temporary certification label permitted by that paragraph to be affixed to the sidewall of the tire, as well as to the tread. Federal Motor Vehicle Safety Standard No. 117 was published March 23, 1972 (37 F.R. 5950) and amended January 31, 1973 (38 F.R. 2982). Although the standard relating to the placement of a conformity label stated that the temporary label would be affixed "to the tread of the tire," the NHTSA did not intend to be restrictive of the label's location, and the limiting language was inadvertent.

*Effective date:* June 1, 1973. This amendment is corrective in nature and imposes no additional

burden on any person. Accordingly, it is found that notice and public procedure thereon are unnecessary, and that good cause exists for an effective date less than 180 days from the day of publication.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51)

Issued on April 12, 1973.

James E. Wilson  
Acting Administrator

**38 F.R. 9668**  
**April 19, 1973**





## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117**

### **Retreaded Pneumatic Tires**

**(Docket No. 1-8; Notice 14)**

On August 21, 1973 (38 F.R. 22493), the NHTSA proposed to amend 49 CFR § 571.117 (Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires") to revise retreaded tire physical dimension requirements, to facilitate the labeling of bias/belted tires, to specify acceptable methods of permanent labeling, and to reduce labeling size. Interested persons were given the opportunity to submit comments by September 24, 1973. Only three comments were submitted within the comment period, none of which objected to the substance of the proposed amendments. Accordingly, the proposed revision of paragraphs S5.1.2, S6.3.1, and S6.3.2 of 49 CFR § 571.117 is adopted without change as set forth below.

*Effective date:* The amendments to S5.1.2 and S6.3.1 are effective January 9, 1974. The amend-

ment to S6.3.2 is effective February 1, 1974. These amendments facilitate compliance with the standard, relieve restrictions, and do not reduce the level of safety established by the standard. Accordingly, good cause exists and is hereby found for an effective date less than 30 days from publication.

(Secs. 103, 112, 113, 114, 119, 201 Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegations of authority at 49 CFR 1.51.)

Issued on January 3, 1974.

James B. Gregory  
Administrator

**39 F.R. 1443**  
**January 9, 1974**





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

## Retreaded Pneumatic Tires

(Docket No. 1-8; Notice 15)

This notice and an accompanying notice of proposed rulemaking (39 F.R. 3571) are intended to implement the decision of the United States Court of Appeals for the District of Columbia in the *National Tire Dealers' and Retreaders' Association, Inc., v. Brinegar* (Case No. 72-1753; decided January 8, 1974). Standard No. 117 was published in its present form on March 23, 1972 (37 F.R. 5950) and amended January 31, 1973 (38 F.R. 2982), March 15, 1973 (38 F.R. 6999), April 19, 1973 (38 F.R. 9668), May 3, 1973 (38 F.R. 10940), and January 9, 1974 (39 F.R. 1443).

Standard No. 117 would have required, effective February 1, 1974, that each retreaded tire be permanently labeled with each of the following items of information: the tire's size designation; the tire's maximum permissible inflation pressure, either as it appears on the casing or as set forth in Table 1 of the standard; the tire's maximum load, either as it appears on the casing or as set forth in Table 1; the actual number of plies, ply rating, or both; the word "tubeless", if the tire is a tubeless tire, or the words "tube-type" if the tire is a tube-type tire; the words "bias-belted", or the actual number of plies in the sidewall and the actual number of plies in the tread area, if the tire is of bias/belted construction; and the word "radial" if the tire is of radial construction. The Court's opinion vacates those parts of the permanent labeling requirements dealing with tire size, maximum inflation pressure, ply rating, tubeless or tube-type, and bias/belted and radial construction. It states that the standard should contain requirements for permanent labeling of the maximum permissible load, the actual number of plies, and the composition of the material used in the ply of

the tire. This notice clarifies Standard No. 117 to require the maximum load to be permanently labeled onto each retreaded tire. As that requirement remains unchanged as a result of the Court's ruling, its effective date of February 1, 1974, is retained. Requirements for permanent labeling of the actual number of plies and the generic name of the cord material are not presently contained in the standard, and are accordingly proposed in a companion notice published on page 3571 of this issue of the Federal Register.

Under the language of Standard No. 117, the deletion of permanent labeling requirements results in a continuation of the existing requirement for affixed labeling in paragraph S6.3.1 with respect to the items of information deleted. Any information required to be labeled by paragraph S6.3.1 that is not permanently labeled onto the tire sidewall, i.e., either retained from the casing or relabeled on to the retreaded tire, must be included on a label, not easily removable, affixed to the tire sidewall.

In light of the above, paragraph S6.3.2 of 49 CFR 571.117 (Motor Vehicle Safety Standard No. 117) is revised. . . .

*Effective date:* February 1, 1974. This notice merely restates an effective date established January 31, 1973 (38 F.R. 2982).

(Sec. 103, 112, 113, 114, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on January 24, 1974.

James B. Gregory  
Administrator

39 F.R. 3553

January 28, 1974





# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117**

## **Retreaded Pneumatic Tires**

**(Docket No. 1-8; Notice 17)**

This notice amends Motor Vehicle Safety Standard No. 117, *Retreaded Pneumatic Tires*, to require additional permanent labeling for retreaded tires. A notice of proposed rulemaking regarding this amendment was published January 28, 1974 (39 F.R. 3571).

The permanent labeling required to be on each retreaded tire by this notice is the actual number of plies in the tire's sidewall and the actual number of plies in its tread area (if different), and the generic name of each cord material used in the plies (both sidewall and tread area) of the tire. These requirements are in addition to the existing requirement that each retreaded tire be permanently labeled with its maximum permissible load.

Under the rule as hereby amended, retreaders do not have to relabel the ply and cord material information if it is retained on the casing sidewall through the retreading process. If the information is removed during processing, however, it must be relabeled so that it will be permanently affixed to the completed tire. If the information does not appear on the casing before retreading the casing may not be retreaded unless the retreader can otherwise determine the correct information.

The requirements for the permanent labeling of these information items are based specifically on section 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1421). The NHTSA did not include them in earlier versions of the standard, as it had concluded that their relationship to safety was not sufficient to justify permanent relabeling. In its opinion in *NTDRA v. Brinegar* 409 F.2d 31 (D.C. Cir., 1974), however, the Court of Appeals stated that under the Safety Act the NHTSA was unauthorized to

reach this conclusion, since Congress had determined that permanent labeling requirements for actual number of plies and cord material must be included in the standard. The proposal of January 28, 1974, was issued as a direct result of that opinion.

Many industry comments suggested that the NHTSA implement this aspect of the opinion by requiring the information to appear on completed retreaded tires only when the information was retained through the retreading process. In cases where the information could not be retained, one comment, from the National Tire Dealers and Retreader's Association (NTDRA), suggested the use of affixed paper or plastic labels to supply the information, so it could be available to the purchaser at the time of purchase. Most of the comments, however, suggested that when the information could not be retained, no requirement should be imposed. These comments argued that for the agency to require otherwise would present substantial burdens on retreaders because of the difficulties in labeling all of the possible combinations of ply and cord material. The industry comments further pointed out that the permanent labeling problem will eventually disappear because of the amendment to Standard No. 109, which requires all tires manufactured after July 1, 1973, to contain required labeling between the tire's maximum section width and bead. This labeling can be retained through the retreading process.

After careful consideration of the issues presented, the NHTSA has determined that it must issue the requirements in the form described. The agency is not unmindful that this will prevent the retreading of some casings otherwise usable, and will require relabeling of the infor-

mation on others. The NHTSA believes that to issue the requirements in the form suggested by the industry comments would not be consistent with the requirements of Section 201 of the Safety Act as interpreted by the Court of Appeals in *NTDRA v. Brinegar*. To follow the industry suggestions would leave some tires without the information permanently labeled. It is impossible to reconcile this result with the statutory requirement as interpreted by the Court. Nor can the agency, in conformity with the statute, establish an effective date so far in the future as to provide sufficient time for tires not containing necessary labeling to enter the retreading process.

Based on its review of the record, the NHTSA does not find the requirement unreasonable or impracticable. Since the opinion in *NTDRA v. Brinegar*, methods have been developed which allow for the permanent labeling or relabeling of retreaded tires using a rubber medallion which is cured to the sidewall of the tire when the tire is in the mold. The comments indicate that this method is presently being used to permanently label not only a tire's maximum permissible load, as required, but its size, ply rating, and whether it is tubeless or tube type as well. The technology for this labeling approach has been fully documented in retreading journals, and in communications to the docket. The NHTSA has furnished opinions stating that the use of the medallion conforms to the standard's permanent labeling requirements. The docket contains clear information regarding the cost of medallion labeling. Each label costs the retreader some 2.5 cents, and the record demonstrates that the cost of both label and application should not exceed 10 cents per tire. This differs from representations previously made regarding permanent labeling costs, which had been represented at \$2.50 per tire.

An additional problem raised in the comments is that adding the two information items greatly increases the labeling burden due to the number of possible combinations of information. The NHTSA does not believe the record supports this contention. According to NHTSA estimates, the variations in ply and cord material are relatively few in bias and bias-belted con-

structions, with only six possible combinations of ply and cord material in the case of bias tires and ten possible combinations in bias-belted construction. Together, these constructions would necessitate a maximum of 16 labels. While NHTSA estimates show a greater number of possible combinations in the case of radial tires, the record in this rulemaking suggests that few radial tires are as yet being retreaded. It appears most radials used for retreading will have been manufactured after July 1, 1973, and will have casings on which no relabeling would be needed.

Furthermore, one comment, which claimed an increase from 67 to 2,000 possible labels, presumed that all of the information (size, ply rating, maximum permissible inflation pressures, tubeless or tube type, as well as maximum permissible load, number of plies, and generic name of the cord materials) is placed on one label. However, there is nothing to prohibit the use of an additional label for both ply and cord material information, or even an additional label for each. Finally, relabeling is necessary only when the specified information is not retained through the retreading process. Estimates furnished by the industry and placed in the docket show that the information added by this amendment is not in a retainable position in only 1 out of 10 tires otherwise suitable for retreading. The requirement would presently affect a maximum of 10% of retreaded tires, and by the time of its effective date that percentage should decrease.

Prior to this amendment, Standard No. 117 required that on or after August 1, 1974, the only casings that could be used for retreading would be those that bore, originally molded into or onto their sidewalls, the symbol DOT, the tire size, and the actual number of plies or ply rating. The notice of proposed rulemaking of January 28, 1974, proposed to delete the ply-rating alternative, making it necessary to use only casings that show the actual number of plies. It also proposed to add a requirement that the casings to be used would be only those that had originally been labeled with the generic names of their cord materials. These casing requirements were proposed on the assumption



that the casing should already contain this information if it is to appear on the completed retreaded tire.

Several comments objected to these proposed requirements on the basis that they would cause a reduction in the number of retreadable casings in certain older and hard-to-find sizes. The NHTSA finds merit in these arguments, and the proposed requirements, that casings used for retreading must be only those that are originally labeled with their actual number of plies and their cord materials, are not adopted. Retreaded tires as they are finally produced must contain this information. But unlike "size" and "ply rating," which are crucial for safety and should only be based on original casing labeling, the NHTSA has decided that retreaders should be free to otherwise obtain information on the number of plies and cord materials and then place it permanently on the tire.

One objection raised in the comments with respect to the requirement that all casings bear the symbol DOT erroneously assumed that these requirements are part of the proposal. The requirement that on or after August 1, 1974, only DOT casings be retreaded was issued March 23, 1972 (37 F.R. 5950), because of the agency's concern over the continued use of older casings

which were not manufactured to meet Standard No. 109. It was based on industry comments that a 6-year supply of casings was required to meet industry needs. August 1, 1974, is 6 years from the date that all new tires were required to be labeled with the specified safety information which is the source of both affixed and permanent labeling under this standard.

The existing casing requirements therefore remain unchanged: the only casings that may be used for retreading are those that bear original permanent labeling of the DOT symbol, size, and the actual number of plies or ply rating.

In light of the above, section 571.117 of Title 49, Code of Federal Regulations (Motor Vehicle Safety Standard No. 117), is amended . . . .

*Effective date:* May 12, 1975.

(Secs. 103, 112, 113, 114, 119, 201; Pub. L. 89-563; 80 Stat. 718 (15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421); delegation of authority at 49 CFR 1.51.)

Issued on November 6, 1974.

James B. Gregory  
Administrator

**39 F.R. 39882**  
**November 12, 1974**





## MOTOR VEHICLE SAFETY STANDARD NO. 117

### Retreaded Pneumatic Tires

(Docket No. 1-8; Notice 7)

**S1. Scope.** This standard specifies performance, labeling, and certification requirements for retreaded pneumatic passenger car tires.

**S2. Purpose.** The purpose of this standard is to require retreaded pneumatic passenger car tires to meet safety criteria similar to those for new pneumatic passenger car tires.

**S3. Application.** This standard applies to retreaded pneumatic tires for use on passenger cars manufactured after 1948.

#### **S4. Definitions.**

**S4.1** "Casing" means a used tire to which additional tread may be attached for the purpose of retreading.

"Retreaded" means manufactured by a process in which a tread is attached to a casing.

**S4.2** All terms defined in § 571.109 and § 571.110 are used as defined therein.

#### **S5. Requirements.**

##### **S5.1 Retreaded tires.**

**S5.1.1** Except as specified in S5.1.3, each retreaded tire, when mounted on a test rim of the width specified for the tire's size designation in Appendix A of § 571.109, shall comply with the following requirements of § 571.109:

- (a) S4.1 (Size and construction).
- (b) S4.2.1 (General).
- (c) S4.2.2.3 (Tubeless tire resistance to bead unseating).
- (d) S4.2.2.4 (Tire strength).

**S5.1.2** Except as specified in S5.1.3, each retreaded tire, when mounted on a test rim of the width specified for the tire's size designation in Appendix A of § 571.109, shall comply with the

requirements of S4.2.2.2 of § 571.109, except that the tire's section width shall not be more than 110 percent of the section width specified, and the tire's size factor shall be at least 97 percent of the size factor specified, in Appendix A of § 571.109 for the tire's size designation.

**S5.1.3** Each retreaded tire shall be capable of meeting the requirements of S5.1.1 and S5.1.2 when mounted on any rim in accordance with those sections.

**S5.1.4** No retreaded tire shall have a size designation, recommended maximum load rating, or maximum permissible inflation pressure that is greater than that originally specified on the casing pursuant to S4.3 of § 571.109, or specified for the casing in Table I.

##### **S5.2 Casings.**

**S5.2.1** No retreaded tire shall be manufactured with a casing—

(a) On which bead wire or cord fabric is exposed before processing.

(b) On which any cord fabric is exposed during processing, except that cord fabric that is located at a splice, i.e., where two or more segments of the same ply overlap, or cord fabric that is part of the belt material, may be exposed but shall not be penetrated or removed to any extent whatsoever.

**S5.2.2** No retreaded tire shall be manufactured with a casing—

(a) From which a belt or ply, or part thereof, is removed during processing; or

(b) On which a belt or ply, or part thereof, is added or replaced during processing.

**S5.2.3** Each retreaded tire shall be manufactured with a casing that bears, permanently molded at the time of its original manufacture into or onto the tire sidewall, each of the following:

- (a) The symbol DOT;
- (b) The size of the tire; and
- (c) The actual number of plies or ply rating

**S5.2.4** [Reserved]

**S6. Certification and labeling.**

**S6.1** Except as specified in S6.2, each manufacturer of a retreaded tire shall certify that his product complies with this standard, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act of 1966, by labeling the tire with the symbol DOT in the location specified in § 574.5 of this chapter.

**S6.2** From June 1, 1973 to July 31, 1973, a manufacturer may certify compliance by affixing to the tread or sidewall of the tire, in such a manner that it is not easily removable, a label that states in letters not less than three thirty-seconds of an inch high:

This retreaded tire was manufactured after June 1, 1973 and conforms to all applicable Federal motor vehicle safety standards.

**S6.3 Labeling.**

**S6.3.1** Each retreaded pneumatic tire manufactured on or after June 1, 1973, shall be labeled, in at least one location on the tire sidewall in letters and numerals not less than 0.078 inches high, with the following information:

- (a) The tire's size designation;
- (b) The tire's maximum permissible inflation pressure, either as it appears on the casing or as set forth in Table I;

(c) The tire's maximum load, either as it appears on the casing or as set forth in Table I;

(d) The actual number of plies, ply rating, or both;

(e) The word "tubeless" if the tire is a tubeless tire, or the words "tube type" if the tire is a tube-type tire;

(f) If the tire is of bias/belted construction, the words "bias/belted", or the actual number of plies in the sidewall and the actual number of plies in the tread area.

(g) The word "radial" if the tire is of radial construction.

The information shall either be retained from the casing used in the manufacture of the tire, or may be labeled into or onto the tire during the retreading process, either permanently (through molding, branding, or other method that will produce a permanent label) or by the addition of a label that is not easily removable.

**S6.3.2** Each retreaded tire manufactured on or after May 12, 1975, shall bear permanent labeling (through molding, branding, or other method that will produce a permanent label, or through the retention of original casing labeling) in at least one location on the tire sidewall, in letters and numbers not less than 0.078 inches high, consisting of the following information:

- (a) The tire's maximum permissible load,
- (b) The actual number of plies in the tire sidewall, and the actual number of plies in the tire tread area, if different; and
- (c) The generic name of each cord material used in the plies (both sidewall and tread area) of the tire.



TABLE I—PLIES

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
6.00-13_____	1010	32	1080	36	1140	40
6.50-13_____	1150	32	1230	36	1300	40
7.00-13_____	1270	32	1360	36	1440	40
6.45-14_____	1120	32	1200	36	1270	40
6.95-14_____	1230	32	1310	36	1390	40
7.35-14_____	1360	32	1450	36	1540	40
7.75-14_____	1500	32	1600	36	1690	40
8.25-14_____	1620	32	1730	36	1830	40
8.55-14_____	1770	32	1890	36	2000	40
8.85-14_____	1860	32	1990	36	2100	40
5.60-15_____	970	32	1040	36	1105	40
5.90-15_____	1050	32	1130	36	1200	40
6.85-15_____	1230	32	1320	36	1390	40
7.35-15_____	1390	32	1480	36	1570	40
7.75-15_____	1490	32	1590	36	1690	40
8.85-15_____	1610	32	1720	36	1820	40
8.25-15_____	1620	32	1730	36	1830	40
8.45-15_____	1740	32	1860	36	1970	40
8.55-15_____	1770	32	1890	36	2000	40
8.85-15_____	1860	32	1980	36	2100	40
9.00-15_____	1900	32	2030	36	2150	40
9.15-15_____	1970	32	2100	36	2230	40
8.90-15_____	2210	32	2360	36	2500	40

TABLE I—PLIES—Continued

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
A70-13_____	1060	32	1130	36	1200	40
D70-13_____	1320	32	1410	36	1490	40
D70-14_____	1320	32	1410	36	1490	40
E70-14_____	1400	32	1490	36	1580	40
F70-14_____	1500	32	1610	36	1700	40
G70-14_____	1620	32	1730	36	1830	40
H70-14_____	1770	32	1890	36	2010	40
J70-14_____	1860	32	1980	36	2100	40
L70-14_____	1970	32	2100	36	2230	40
C70-15_____	1230	32	1320	36	1390	40
D70-15_____	1320	32	1410	36	1490	40
E70-15_____	1400	32	1490	36	1580	40
F70-15_____	1500	32	1610	36	1700	40
G70-15_____	1620	32	1730	36	1830	40
H70-15_____	1770	32	1890	36	2010	40
J70-15_____	1860	32	1980	36	2100	40
K70-15_____	1900	32	2030	36	2150	40
L70-15_____	1970	32	2100	36	2230	40



TABLE I—PLIES—Continued

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
165-13 _____	1050	32	1130	36	1200	40
175-13 _____	1150	32	1240	36	1350	40
185-13 _____	1270	32	1390	36	1510	40
155R13 _____	950	32	1015	36	1075	40
155R14 _____	1010	32	1080	36	1140	40
155R15 _____	1015	32	1085	36	1150	40
165R13 _____	1010	32	1080	36	1140	40
165R14 _____	1120	32	1200	36	1270	40
165R15 _____	1130	32	1200	36	1270	40
175R14 _____	1230	32	1310	36	1390	40
185R14 _____	1360	32	1450	36	1540	40
185/70R13 _____	1090	32	1140	36	1190	40
145-14* _____	865	32	905	36	935	40
145-15 _____	895	32	940	36	975	40
195-15 _____	1550	32	1680	36	1820	40
205-15 _____	1700	32	1840	36	2000	40

\* Dash Radial—Not an "R" Radial

36 F.R. 7315  
April 17, 1971



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 118

### Power-Operated Window Systems for Passenger Cars and Multipurpose Passenger Vehicles (Docket No. 69-11a)

In May 1968 the Director of the National Highway Safety Bureau issued a public advisory, stating that numerous cases of injury and death from accidental operation of power windows had been reported to the Bureau. He warned that many of those injuries and deaths had occurred because power windows could be closed when the ignition switch was off. In the advisory, the Director cautioned owners of vehicles with power-operated windows to have the wiring adjusted to prevent closure of the windows when the ignition switch is off.

It has been determined that the interests of motor vehicle safety require the imposition of a safety standard which will reduce, if not eliminate, the toll of deaths and injuries resulting from accidents involving power-operated windows.

A notice of proposed rule making relating to power-operated window systems in passenger cars and multipurpose passenger vehicles was published in the *Federal Register* on August 23, 1969 (34 F.R. 13608). Comments were requested concerning two objectives of the proposal: (1) To minimize the likelihood of personal injury or death occurring when a person is caught between a closing window and the frame, channel or seal, and (2) to insure that vehicle occupants can make emergency exits from vehicles equipped with power-operated windows in the event of a severe accident.

The comments received have been given careful consideration in the formulation of the safety standard issued today. To achieve the first major objective it was proposed that a power-operated window, once opened, not close when the ignition key of the vehicle is not in the "on" or "start" position. This proposal would have pro-

hibited operation of windows when the key was in the "accessory" position, a position provided to avoid battery discharge and possible damage to the electrical system. The proposal would also have prohibited activation of power tailgate windows from the exterior of the vehicle. Several commenters objected that the proposal would in these respects prohibit widely accepted convenience features without corresponding safety benefits. These comments have been determined to have merit, and the standard as presently issued has been modified to require that a power-operated window system not be operative, except by muscular force or by operating an outside lock, when the key is removed from the ignition lock or is in an off position. This permits operation of windows with the key in the "accessory" position, as well as by a key-locking system on the exterior of the vehicle.

To achieve the second objective, it was proposed that a control be required that would open power-operated windows from inside the passenger compartment of the vehicle, regardless of the key position. Allowance of such a control, however, might tend to defeat the first major objective, and also make it easier for thieves to enter a locked vehicle. Further, an accident severe enough to jam a vehicle door very likely would be severe enough to jam the window in its channel or to interfere with the power source for emergency operation of the window. For these reasons this proposal has not been adopted in Standard No. 118. The standard does, however, permit installation of master control switches for overriding control of power-operated windows when the ignition key is in a position other than off.



**Effective: February 1, 1971**

Comments indicated an assumption that power-operated interior partitions were covered, as they were intended to be, though not specifically mentioned in the preamble of the proposal. To insure that there is no ambiguity on the point, Standard No. 118 includes partitions in the requirements.

The subject matter covered by this rulemaking action is being adopted at this time because it has been determined that it is feasible and that it can be implemented at an early date. The notice of proposed rule making upon which this rulemaking action is based was issued in conjunction with an advance notice of proposed rule making (34 F.R. 13609, Aug. 23, 1969) on power-operated window systems that dealt with the subject of mechanisms that would interrupt, stop, or reverse the direction of the window when a predetermined force is exerted on an object between the glazing and the frame, channel, or

seal upon which it closes, and other fail-safe considerations. The advance notice involved engineering and economic problems of a substantial magnitude. Those problems and their solutions are undergoing further study and will be given consideration for rulemaking based on the results thereof.

In consideration of the foregoing, 49 CFR 571.21, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 118, Power-Operated Window Systems . . . .

Effective date: February 1, 1971.

Issued on July 17, 1970.

Douglas W. Toms,  
Director,  
National Highway Safety Bureau

**35 F.R. 11797  
July 23, 1970**

# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 118

## Power-Operated Window Systems

(Docket No. 74-1; Notice 3)

The purpose of this notice is to amend Standard No. 118, *Power-Operated Window Systems*, 49 CFR 571.118, to permit the operation of power windows under certain conditions when the ignition is not in the "on" position.

On September 23, 1974, the agency published a notice (39 F.R. 34062) proposing to allow the operation of power windows, when the key that controls the vehicle's engine is in the off position or is removed from the lock, only in circumstances where (1) only muscular force is used, or (2) a key-locking system on the vehicle's exterior is activated, or (3) a door that has no frame meeting the upper edge of the closed window is opened a specified amount and a switch separate from the normal power window switch is activated.

Nine comments were submitted to the docket, all of which approved of the basic proposal to allow operation of the power windows when the vehicle engine is not running. General Motors, who suggested the proposal as it was published, supported its adoption. However, most of the commenters objected to the proposed provision that a separate switch be required to operate a window when the door is open to a degree sufficient to permit a ball the size of a child's head to pass between the top edge of the fully closed window and the vehicle's roof rail. The objection was based on a contention that the separate switch provision was design restrictive and not necessary from a safety standpoint. According to the comments, required use of a separate switch for activation of the windows when the doors are opened would not assure a higher level of safety than use of the normal power activation switch.

The NHTSA finds merit in commenters arguments. It is the considered opinion of the agency that the absence of a separate switch requirement will have no effect on the safety of the power-operated window system since no switch would be capable of activation unless the vehicle's door were opened to the specified distance. For this reason the proposed separate switch requirement is deleted. Manufacturers will thus be free to install whatever type of activation system they wish, as long as the criteria of S3(c) are satisfied.

In addition, the description of the locations between which the test ball must fit appears to need clarification. It is the agency's intention that the ball be capable of passing between the upper rear corner of the fully closed window and the vehicle's roof rail. Therefore, the term "trailing edge" in S3(c) is changed to "upper rear corner."

In consideration of the foregoing, S3. of Standard No. 118, *Power-Operated Window Systems* (49 CFR 571.118) is amended. . . .

*Effective date:* Because this amendment relieves a restriction and imposes no additional burden on any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued: July 23, 1975.

James B. Gregory  
Administrator

40 F.R. 31773  
July 29, 1975





## MOTOR VEHICLE SAFETY STANDARD NO. 118

### Power-Operated Window Systems

(Docket No. 69-11a)

**S1. Purpose and scope.** This standard specifies requirements for power-operated window and partition systems to minimize the likelihood of death or injury from their accidental operation.

**S2. Application.** This standard applies to passenger cars and multipurpose passenger vehicles.

**S3. Requirements.** When the key that controls activation of the vehicle's engine is in an off position or is removed from the lock, no power-operated window or partition shall be movable except—

(a) By muscular force unassisted by a power source within the vehicle;

(b) Upon activation by a key-locking system on the exterior of the vehicle; or

(c) In the case of a door that does not have a frame that meets the upper edge of the window in its closed position, by activation of a switch that is energized only when the door is opened wide enough to permit a ball 8 inches in diameter to pass between the upper rear corner of the window in its fully raised position and the vehicle's roof rail.

35 F.R. 11797

July 23, 1970



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 119

### New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71-18; Notice 3)

This notice establishes a new Motor vehicle safety standard No. 119 *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, which specifies performance and labeling requirements for new pneumatic tires designed for highway use on multipurpose passenger vehicles, trucks, buses, trailers and motorcycles manufactured after 1948, and which requires treadwear indicators in tires, and rim matching information concerning those tires.

Notices of proposed rulemaking on this subject were published on August 5, 1971 (36 F.R. 14392), and July 8, 1972 (37 F.R. 13481).

The July 1972 notice proposed that, instead of including the voluminous "tire tables" of tire size designations, maximum loads and inflation pressures, and dimensions in the standard, the manufacturers continue as at present to use the industry association tire and rim manuals for the purpose of product standardization. Since the only tire characteristics relevant to the safety performance tests of the standard are general tire type, speed restrictions, maximum load rating, load range, and rim diameter, all of which are readily available or labeled on the tire itself, the tables are not necessary for the performance requirements. To prevent these private associations from having ultimate regulatory power over individual manufacturers, a provision was included in the proposal by which a manufacturer who wished to differ from the values in the association tables could do so by providing separate information to the NHTSA, to his dealers, and to the public upon request. To prevent the under-rating of tires of an established size designation, another provision would prohibit the assignment by a manufacturer of a maximum load rating to a particular tire size designation

that is lower than the load rating already published elsewhere for that tire size designation.

Many domestic tire manufacturers objected to lack of tire tables on the grounds that it in effect endorsed non-standardization of tire specifications. They and some representatives of the trucking industry speculated that there might be danger of mis-match arising from the production of tires whose dimensions deviate substantially from the published dimensional specifications for tires of that size designation. Several of the domestic manufacturers recommended inclusion of the (American) Tire and Rim Association tables in the standard because of the experience that domestic manufacturers have with road conditions in the United States.

Other manufacturers, however, supported the deletion of tire tables for several reasons. They argued that a single standard would discourage innovation in tire design and suggested that the complexities of selection and maintenance of truck tires could not be reduced to a single table of values. They asserted that standardized new-tire dimensions do not eliminate the need to measure tires for proper dual matching, because tires wear differently in use and thereafter rarely match new or used tires of the same size.

Upon consideration of all relevant information, the NHTSA has concluded that the position taken in the proposal is sound, and it is adopted in the rule. The inclusion in the Code of Federal Regulations of load-inflation and dimension tables for every road tire sold in this country (they presently are included in Standard 109 only for passenger cars) would be a vastly cumbersome process, not only in its inception but as a continuous maintenance task. The NHTSA finds no justification at this time for undertaking



to monitor substantively the manufacturer processes and testing that lead to the continual changes in the standard association tables, so its function in this regard would be largely clerical. The point is not, as the (U.S.) Rubber Manufacturers Association asserted, primarily one of "administrative convenience". It is that no justification has been found for locking both the government and the world tire industry into a restrictive and unwieldy system by which the Code of Federal Regulations is formally amended every time a manufacturer decides to add a tire size, or change the load rating or dimensional specifications of one of its tires. There are many reasons to avoid over-regulation; "administrative convenience" is among the least of them.

This agency has no intent to dilute the standardizing function of the trade-association table systems that presently are used to provide necessary tire and rim information to dealers and users. These systems monitor the safety aspects of tire dimension and load rating satisfactorily now without government regulation, and the NHTSA expects that they will continue to do so. No evidence has been presented of under- or over-sizing of tires that would warrant the institution of a massive government regulatory program in that area. If such a practice should arise in the future to a degree that constitutes a public hazard, the NHTSA has ample authority to deal with it specifically, as a safety-related defect, and prospectively, under its rulemaking powers.

The argument that the agency should include only the domestic Tire and Rim Association tables, thereby requiring foreign tire manufacturers to build tires under the specifications, and presumably the approval, of the domestic association, is found to be without merit. The wording and the legislative history of the National Traffic and Motor Vehicle Safety Act show a clear Congressional intent to give evenhanded treatment to domestic and foreign manufacturers of motor vehicles and equipment, and this has always been the policy of the NHTSA. This agency has no evidence that foreign associations or manufacturers lack the information necessary to produce safe tires for the American market.

Finally, the argument that the agency could or should by some means prevent "proliferation" of new tire sizes is without substance. No concrete justification has been presented for attempting to limit the introduction of new tire sizes, and to date no significant safety problems have been found caused by the addition of new tire sizes. The NHTSA assumes that the competition and consumer demand forces of the private sector will operate as in other areas of our economy, to produce a satisfactory product population.

The criteria for tire failure in the endurance and high speed laboratory tests have been substantially modified from those of the proposal in response to comments to this docket and Docket 71-10, Notice 2 (37 F.R. 19381, September 20, 1972), which proposed identical changes in the passenger car tire failure criteria. This regulation adopts the same failure criteria as were adopted in final form for passenger car tire tests on September 28, 1973 (38 F.R. 27050), and relies on several new and revised definitions found in Standard 109. The preamble to the passenger car tire amendment fully explains the modifications made, and it is only noted here that the changes are substantially in agreement with manufacturers' requests to specify the tire failures with particularity. A pre-test inspection has been added to discover failures in construction evident without dynamic testing. Additionally the required air pressure following the test run has been raised to 100 percent of the original pressure.

Several comments questioned the inclusion of all non-passenger car tires in one standard, pointing out that tire design differs radically to optimize desirable characteristics for each vehicle type and application. However, this standard does not attempt to measure the optimum characteristics of each type of non-passenger tire. This standard only establishes minimum performance characteristics which any type of tire must satisfy to be safely used on public highways. Passenger car tires have been subjected to such a standard in the past and this proposal extends a comparable minimum standard to all other tire types designed for highway use. The requirements recognize the design differences

between tire types by establishing different test values for different tire types, size, construction, load ranges, and speed restrictions.

Comments to the docket requested physical tolerances and related accommodations for test purposes. These arise from misunderstanding of the legal nature of the safety standards, which are performance levels that each vehicle or item of motor vehicle equipment must meet, and not instructions for manufacturer testing. The temperature conditions for tire testing have been reworded to reflect the legal meaning and the NHTSA testing practices relative to tire standards. The proposed standard would make clear that the tire must be capable of meeting the requirements when tested at any ambient temperature up to 100° F. The legal significance of this requirement is explained in a general provision of Part 571, § 571.4, *Explanation of usage*. In NHTSA compliance testing, the ambient temperature would be maintained in a range between 90° and 100° F., and any test failure under those conditions would be considered a failure to meet the standard. Manufacturer testing should be directed at proving the tire's capability in the exercise of due care, by testing under conditions at least as adverse as any that could be established in accordance with these procedures.

The trucking industry questioned the advisability of labeling maximum inflation and load rating on the tire because it appeared to prohibit the adjustment of pressures to road conditions. The purpose of the labeling is to establish test values for the tire and to warn the user of the tire's maximum capabilities. The label does not prohibit adjustment of pressure to suit road conditions or prevent a manufacturer from recommending other inflation-load combinations on the tire or in accompanying literature to suit specific circumstances.

European manufacturers objected to the requirement that load rating be indicated by a "load range" index not in world-wide use. The primary purpose of the load range index is to indicate categories of strength within the size designations, for user information and test purposes. It should be understood that a manufacturer may use whatever additional systems he chooses to indicate his assessment of tire

strength. Information such as metric equivalents and ply ratings, for example, may be added to sidewall labeling as long as the required information appears in the required format on the tire.

Several manufacturers suggested that labeling appear on only one side of a tire when both sides of the tire, as mounted, will be available for inspection. Accordingly, motorcycle tires must now be labeled on one side only, but the inaccessibility of both sidewalls on truck and bus tires for visual inspection precludes one-sidewall labeling of these categories.

Despite this inaccessibility, however, the identification code appears on one sidewall only, because placing the ID slug in the upper half of a hot process mold is a difficult and dangerous operation. In response to another labeling request, the DOT symbol must not be placed on the tire before the effective date of the standard.

Several manufacturers argued for greater design freedom in the placement of treadwear indicators because the proposed locations could generate useless, arbitrary information when applied to "lug" tread designs. In response, tread "groove", "width", and "depth" have been defined so that the treadwear indicators are placed to indicate wear in that portion of the tread which contacts the ground.

Several comments on the endurance requirement requested lower test loads and speed to approximate actual driving conditions on flat surfaces. The NHTSA does not utilize the laboratory test wheel to simply approximate road conditions but rather to apply strictly controlled amounts of stress to moving tires over long periods in order to measure a minimum level of performance. Industry testing established these values and they have been independently verified in NHTSA's Safety Systems Laboratory as an accurate gauge of tire endurance. Another manufacturer expressed confusion about the appropriate endurance test standards for mining and logging tires. These tires are generally speed-restricted tires and should be tested in accordance with the values established in Table III for all other speed-restricted tires.

In response to another comment, it should be noted that test accuracy also requires a stand-



ardized test wheel diameter, because the wheel's curvature directly affects a tire's ability to absorb strain.

Several manufacturers requested elimination of the pressure reading following the 47-hour run so that they could run the tire to destruction in accordance with industry test practices without stopping to make the measurement. This request can not be granted because the new procedures for evaluating tire failure necessitate stopping after the run to inspect the tire, in addition to stopping to take a pressure reading.

Comments raised the validity of the strength test when applied to tires incorporating recent innovations in tire design. It appears that recent changes in the construction of passenger car tires, especially the addition of belts under the tread, have tended to make the strength test specified in Standard 109 obsolete (38 F.R. 1055, January 8, 1973). However, the construction of non-passenger tires permits accurate measurement of tire strength without the "bottoming out" problem noted in the comments, if the proper plunger size and breaking energy value are used. A differential in breaking energy value between tubed and tubeless tires accommodates the smaller dimensions of the newer tubeless configurations that replace tube tires of the same load range. The "light truck" category accommodates the different design and construction materials which manufacturers use in these tires designated for this specialized service. The NHTSA does not agree that lower breaking energy values should apply to tires under 7 inches in section width as suggested in one comment, because these tires are no smaller than typical passenger car tires subjected to similar testing and similar conditions on the highway. In response to another comment, the NHTSA has concluded that differences in the construction of steel-belted tires are not sufficient to justify lower energy values in the plunger test similar to those extended to rayon tires.

Objections to the high speed performance requirements questioned the testing of all light tires (load ranges A, B, C, and D) under the same high-speed conditions. The NHTSA has

eliminated speed-restricted tires from the requirements but will maintain high-speed requirements for all motorcycle, trailer, and truck tires. While it is true that these tires are specially constructed for their purpose and often are mounted on vehicles marked with speed restrictions, there is no assurance that these tires will be properly utilized. The difficulty lies with drivers who ignore rental trailer speed limits, subject boat or mobile home trailer tires to higher than recommended speeds, attempt to improve the performance of their low speed motorcycles, or drive trucks equipped with light truck tires at high speed on the highway. This probability of abuse creates a safety problem which can be met by requiring these tires to withstand such high speed abuse. Load range D tires over 15 inches in section width are presently subject to the high speed test but may be reclassified on the basis of future test experience.

Comments to the docket objected to the proposed effective date and requested up to 18 months leadtime following issuance of the standard on the grounds that the large variety of tires to be certified requires substantial enlargement of test facilities. This standard has been in various proposal stages for 4 years, however, which has provided the tire industry ample opportunity to make plans for the acquisition and installation of test facilities and therefore leadtime of 9 months is considered adequate.

In consideration of the foregoing, a new Standard 119, *New pneumatic tires for vehicles other than passenger cars*, is added to Part 571 of Title 49, Code of Federal Regulations, to read as set forth below.

Effective date: September 1, 1974.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on November 5, 1973.

James B. Gregory  
Administrator

**38 F.R. 31299**  
**November 13, 1973**



## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119**

### **New Pneumatic Tires for Vehicles Other than Passenger Cars**

**(Docket 71-18; Notice 5)**

This notice amends Standard 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, by changing the effective date from September 1, 1974, to March 1, 1975.

A major concern of manufacturers commenting on Standard 119 as it was published in final form on November 13, 1973, (38 F.R. 31299), with a September 1, 1974, effective date, was the limited leadtime in which to modify tire molds and certify the conformity of tires. Correct use of the DOT symbol, lettering height, and clarification of treadwear indicator language required attention before the changeover process could begin.

Manufacturers requested up to 11 months' additional leadtime in view of these difficulties. Amendments have been proposed that would resolve these specific problems. Because the range of non-passenger car tires is so great, however, the National Highway Traffic Safety Administration has determined that even with these changes an additional 6 months' leadtime is justified to accomplish full certification.

Other matters raised by petitions for reconsideration are presently under consideration and will be answered in accordance with the procedures of 49 CFR 553.35, *Petitions for reconsideration*.

In consideration of the foregoing, Standard 119 (49 CFR § 571.119) is amended by changing the effective date of September 1, 1974, to March 1, 1975.

Because this amendment creates no additional burden, and because changeover scheduling must begin immediately, it is found for good cause shown that notice and public procedure thereon are impracticable and unnecessary.

(Secs. 103, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on January 29, 1974.

James B. Gregory  
Administrator

**39 F.R. 4087**  
**February 1, 1974**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

### New Pneumatic Tires for Vehicles Other than Passenger Cars

(Docket 71-18; Notice 6)

This notice responds to petitions for reconsideration on Standard 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, published November 13, 1973 (38 F.R. 31299). In response to comments by twelve tire manufacturers and trade associations, the definitions, labeling, and performance provisions of the standard are amended in several respects.

#### *Justification for Issuance of Standard 119*

The Rubber Manufacturers Association (RMA), supported by most domestic tire manufacturers, petitioned for withdrawal of Standard 119 on the grounds that promulgation of the standard did not satisfy the criteria for the establishment of Motor Vehicle Safety Standards set out in § 103 of the National Traffic and Motor Vehicle Safety Act of 1966. Section 103(f) of the Act requires that the formulation of a standard include consideration of its appropriateness for particular items of motor vehicle equipment, relevant safety data, and the extent to which it will contribute to carrying out the purposes of the Act. As formulated a standard must be practicable, meet the need for motor vehicle safety, and be stated in objective terms.

In petitioning for withdrawal of Standard 119 for failure to "meet the need for motor vehicle safety," the RMA and those tire manufacturers who support its position effectively assert that no tire safety hazard exists which can be met by Standard 119. The National Highway Traffic Safety Administration (NHTSA) does not agree.

Congress recognized a tire safety problem. The Senate held hearings on and considered a bill devoted totally to tire safety (S1643). The House included a separate title in H.R. 13228 to emphasize tire safety as a particularly important area for the issuance of safety standards.

In a number of bills which have been introduced in both Houses as well as in a bill which has passed the Senate (S.2669) the necessity for standards for tires was considered as an independent problem and without reference to its relationship to the total traffic safety problem. S.2669 is confined only to the improvement of tires for passenger cars and station wagons. The committee decided that although *tires are a highly important part of the total traffic safety problem* they are, nevertheless, an integral part of it and should be dealt with in the context of the problem and not in a piecemeal fashion. . . .

However the committee did feel that it was necessary to emphasize this aspect of the safety problem and to establish certain specific requirements which should be contained in the Secretary's standards on tires. (emphasis supplied) H.R. Rep. No. 1776, 89th Cong., 2d Sess. 32 (1966).

On the House floor, Representative Springer detailed the effect of the legislation on motor vehicle equipment.

Obviously, the most important piece of equipment which comes to mind is the tire. The other body treated this subject in separate legislation, but it seems to me, and it did to our committee, that tire standards must be part and parcel of any legislation which seeks to impose standards of safety for the cars on the highway. Consequently, a portion of the bill was devoted specifically to this subject. It requires minimum standards for all tires, and then sees to it that the buyer will have all the information he needs to make a decision as to the tire he needs.



112 Cong. Rec. 18,780 (daily ed. Aug. 17, 1966)

Congress showed particular interest in passenger car tires, but did not limit the legislation to them, as suggested by Firestone in its petition for reconsideration. As the House report notes, Title II represents a broadening of the tire safety issue from passenger cars and station wagons. The language of Title II refers to tires of "each motor vehicle" and to a uniform tire quality grading system "for motor vehicles." Section 204 is devoted to regrooved tires which are commonly utilized on non-passenger cars.

The NHTSA has concluded that the tire safety problems recognized by Congress can best be met by Standard 119. The standard requires labeling and tire-rim matching information to aid proper application of the tire, and minimum performance levels to ensure adequate designed-in safety for normal use and predictable abuse on the road. The standard is directed at misuse of tires as well as their correct use.

It is true that Bureau of Motor Carrier Safety statistics indicate that professional maintenance, cost consciousness, and frequent state inspections result in a lower than normal number of tire failures on interstate haulers. These figures, however, are not representative of tire conditions throughout the multipurpose passenger vehicle (MPV), truck, bus, motorcycle, and trailer categories. Congress mandated minimum tire safety standards although it was aware that tire failure statistics were difficult to isolate, realizing that tire design, while not a major cause of failures in well-maintained tires, could offer a margin of safety where tires are misused. Hearings on S.1634 Before the Senate Commerce Committee on Tire Safety, 89th Cong., 1st Sess., ser. 89-37 at 41 (1965); Hearings on S.3005 Before Senate Commerce Committee on Traffic Safety, 89th Cong., 2nd Sess., ser. 89-49 at 158, 159 (1966). In its formulation of the standard, the NHTSA considered data which showed that worn and misapplied tires create a significant safety hazard. Standard 119 ensures that the information required by Congress to be on tires, along with additional tire-rim matching information and treadwear indicators, are available to the unknowledgeable individual who must select,

maintain, and replace non-passenger tires periodically. The RMA itself argued for the inclusion of load-rating information in this standard as an effective means to eliminate the dangers of proliferation and misapplication of tire sizes. In the area of tire design, the minimum performance levels in Standard 119 ensure a margin of safety for persons who may misapply or abuse tires despite the label information and treadwear warnings.

The NHTSA experience with performance standards for passenger car tires also supports Standard 119 rulemaking. Since the beginning of certification testing by the manufacturers and compliance testing by the NHTSA, the percentage of test failures has dropped from approximately 5.6% to less than 1%. At the same time 88 recalls of 1,436,118 tires have removed from the road substantial numbers of tires which could not be shown in the exercise of due care to be able to meet the minimum requirements. Standard 119 has similar performance tests, calculated to produce close surveillance of test failure percentages and recalls when a faulty tire design is identified. The performance test levels vary according to tire type to ensure that the standard is reasonable, practicable, and appropriate for the particular tire design in its intended service application.

The NHTSA has found that Standard 119 will weed out faulty tire design and promote safety. The test values of Standard 119 were originally proposed by industry and checked by the NHTSA at its Safety Systems Laboratory. The RMA conducted a similar series of tests at that time and later endorsed the requirements as modified in minor respects:

The laboratory tests and values in the proposed FMVSS 119 as amended by our comments would set standards of performance that would enable the industry to design tires that would ensure safe operation on the highways. Comment #4 to Docket 1-5, Notice 7 (p 6).

By reference to *H & H Tire Company v. United States Department of Transportation*, 471 F2d 350 (7th Cir 1972), the RMA and Firestone raised the issue of Standard 119's prac-

ticability. This requirement, at § 103(a) of the Act, was interpreted in *H&H* to mean that the NHTSA must determine the technological and economic consequences of the standard on the regulated industry. In that case the Court determined that the retread tire industry could be destroyed by the expense of major product redesign or the loss of business which could result from passing on these costs in higher prices to the typical retread consumer. The Court also pointed out that the retread consumer might use older worn tires longer than previously and thereby in effect increase the tire hazard problem in response to Standard 117.

In contrast, the NHTSA has determined that compliance with Standard 119 does not require significant or impracticable technological change. Tests run at the Safety Systems Laboratory indicate that a sampling of production-run tires can meet the required performance levels, as they are now constructed. An analysis of benefits and costs demonstrates that the costs of additional testing are less than the estimated savings in property and lives. Finally, the consumer of new tires is less likely than the retread consumer to shift his tire purchase habits and has less opportunity to do so. The NHTSA has carefully determined the technological and economic impact of Standard 119 on the new tire industry and found it to be practicable.

The NHTSA totally disagrees with the RMA and Firestone in their final argument that safety-related defect notification offers adequate protection to consumers without the addition of a safety standard. Firestone inaccurately equates the effect of a standard with that of a notification campaign, claiming that in either case a manufacturer must recall tires containing defects or face civil penalties. Issuance of a standard imposes significantly greater responsibility on a manufacturer to assure himself in the exercise of due care that his product is safe before it is sold and subsequent use reveals a safety-related defect.

#### *Technical Consideration of Standard 119*

The Application section (S3.) raised several questions about the standard's relationship to Standard 109-type tires, experimental tires, and low speed and off-road vehicle tires. The stand-

ard applies to new tires designed for highway use on non-passenger-car motor vehicles. The present language makes clear that tires which do not meet these criteria are not subject to the standard, including those tires subject to Standard 109. The tire manufacturer himself must determine whether his tires, restricted or not to speeds under 35 mi/h, or used on slow-moving vehicles on or off the highway, were designed by him for highway use. As an example, Dunlop cited moto-cross tires which use the public highway "during the course of competitions." Without evidence to the contrary, however, the NHTSA assumes that these tires are used to get to and from the competition over the public highways. In answer to a related request for interpretation by Bridgestone, it is the designed and intended use of the tire (as realistically anticipated by the manufacturer) that matters, not a simple marking such as "Not For Highway Use" on the tire sidewall. In the case of "experimental" or "survey" tires the tires are designed for highway test purposes and are subject to the standard.

The definition of light truck tire has been revised in response to comments from the RMA and the Japan Automobile Tire Manufacturers Association. They cited a number of light truck tires which may or may not share a common size designation or dimensions with passenger tires, but still require special test values because of their heavy-service construction.

Standard 119 does not include the voluminous "tire tables" of tire size designation, maximum loads and inflation pressures, and dimensions requested by the domestic tire industry. An explanation of this approach accompanied issuance of the rule (38 F.R. 31299, November 13, 1973). While the RMA and Goodyear have restated their earlier position that product standardization can only be assured by Government publication of industry association tables, they did not respond to the extensive justification made with the rule. The NHTSA concludes that its determination is sound.

Nearly all tire manufacturers commented on Standard 119's labeling provisions and the amount of leadtime necessary to implement them. To resolve the most pressing problems, the NHTSA has already issued notices that postpone



the effective date of the standard 6 months and propose a lettering size and depth, use of the DOT symbol prior to the standard's effective date, and clarification of the treadwear indicator requirement. (39 F.R. 4087, February 1, 1974, 39 F.R. 3967, January 31, 1974). All other petitions which concern the labeling provisions are treated in this response.

The RMA and the European Tyre and Rim Technical Organization (ETRTO) requested changes in paragraph S6.5(d) ("Tire marking"), several of which are adopted in this amendment. The word "corresponding" is inserted before "inflation pressure" to accommodate tires whose maximum load rating is not at maximum inflation. Punctuation is removed from the legend that appears on the tire to simplify stamping. The example is revised to make clear that "TIRE RATED FOR SINGLE AND DUAL LOAD" and "TIRE RATED ONLY FOR SINGLE LOAD" do not appear on the tire sidewall. ETRTO suggested that a title appear on the tire to qualify the information provided, but the NHTSA has concluded that the information alone is more helpful to the unknowledgeable user, and that a knowledgeable user would refer to the tire tables for exact information before changing tire inflation pressure.

Paragraph S6.5(e) on speed restricted tires has been clarified to limit the requirement to tires restricted to 55 mi/h or less. S6.5(f) remains unchanged, because the National Traffic and Motor Vehicle Safety Act of 1966 requires that the actual number of plies and ply composition appear on the tire sidewall. The words "tube type" appear on tires under S6.5(g) because many consumers are unaware of the significant distinctions between tube type and tubeless tires. Dunlop's request that treadwear indicators be required on tires that are regrooved is beyond the authority under which Standard 119, applying only to new tires, was issued.

Paragraph S6.5(j) calls for a single letter to appear on the tire to indicate categories of strength within the size designation, for user information and test purposes. As the ETRTO pointed out, a requirement for any additional wording such as "load range" could confuse international standardization efforts. Manufactur-

ers are, of course, entitled to add labeling information as long as the required information appears in the required format on the tire.

The maximum load rating provision in S6.6 requires tires of a particular size to have a maximum load rating at least as great as the lowest rating published for that size. In this way the publications do not mislead a consumer who assumes that a particular tire size must have only the load ratings listed. The RMA advocated that more particular load rating information be supplied to aid in actual tire selection. Reference to any factors other than tire size, however, would detract from the desired concept that, for one tire size, there is one lowest maximum load rating, and that load rating is published.

Two substantial requests were raised with regard to the endurance requirement. Uniroyal petitioned for a reduction in the duration of the three test phases to 4 hours each. The NHTSA is considering that submission but must deny action on it at this time because an independent evaluation of the procedures has not yet been conducted, and because there has not been notice or opportunity to comment on the proposal by all interested persons.

The RMA petitioned for 34-hour endurance testing of all tires subject to the high speed test (S6.3) on the grounds that the 47-hour speed/endurance test would be redundant. The NHTSA agrees and has revised Table III accordingly.

The ETRTO proposed new test values for some motorcycle tires, but the request was unclear as to the meaning of the 62 mi/h criterion and the unsupported request cannot be granted. If, in the future, the ETRTO petitions for rule-making to revise the table, an explanation of the criterion and a justification for the test values would permit an informed decision.

Comments to the strength test questioned plunger size and energy values, the computation procedures, and the appropriateness of the test to mobile home, special trailer, wide base, and radial tires.

The RMA argued that the limited service of most mobile home and special trailer tires could not justify the increased cost necessary to upgrade the strength of the tires to meet the requirement. The NHTSA has consistently treated



mobile homes and other trailers as full-fledged motor vehicles and applied applicable standards rigorously to reduce the number of crashes in which mobile homes are involved, as indicated by BMCS statistics. The RMA request is denied to ensure that equally-rated tires on towed and towing vehicles will, in fact, meet equal minimum strength requirements.

The RMA and ETRTO generally advocated larger plungers or reduced energy values for tires and the ETRTO petitioned for the exclusion of radial tires from the strength test. The NHTSA has determined that the established values and plunger sizes, drawn from industry experience, adequately measure tire strength. Any future petitions for rulemaking to change these values should be accompanied by detailed supporting data, as was submitted by Uniroyal in its petition for reconsideration.

Comments again requested that a plunger which contacts the rim be considered to have established an energy value which meets the strength requirement. The NHTSA reiterates its position that the standard's present energy values measure the strength of a well-constructed non-passenger car tire before the tire breaks or the plunger contacts the rim. Specific test values may be revised based on future test experience, but revision of the calculation procedures used for all tires is not justified. The request for three plunger applications in the case of 12-in. or smaller diameter tires has been granted.

Michelin and the ETRTO have inquired as to the NHTSA's position with regard to tubeless tires above load range J. Such tires, when marketed in the United States, are subject to this standard, and the NHTSA would like the benefit of detailed description of, and test experience with, these tires before it establishes test requirements. It is requested that support for ETRTO or Michelin values be submitted to the NHTSA Tire Division.

The high speed performance requirement was adopted to test different tire characteristics from those tested under the endurance performance requirement. The test is run only on non-speed-restricted tires in the lighter load ranges because,

for tires of heavier construction, the endurance test alone develops temperatures which evaluate all the characteristics satisfactorily. The RMA and several manufacturers have pointed out that the endurance test can serve this purpose for large tires even in the lighter ranges, and the NHTSA, therefore, restricts the high speed requirements to motorcycle tires and to non-speed-restricted tires of 14.5-in nominal rim diameter or less marked Load Range A, B, C, or D. Light truck tires and other tires which are 14.5-in and smaller remain subject to the high speed requirements because the NHTSA has determined that the high speed test measures different values than the endurance test in these smaller sizes.

The definition of tire failure is closely related to the endurance and high speed performance tests. The RMA and several tire manufacturers requested re-definitions of several terms and revision of the tire cooling procedures related to tire failure. The NHTSA has established Docket 71-10, *New pneumatic tires, revised performance requirements*, to treat the re-definition of tire failure, and will respond to these issues in a notice to that docket.

Interested persons should remember that, in addition to the amendments set forth below, the NHTSA has already amended the effective date of the Standard to March 1, 1975, and has proposed amendments to the lettering, DOT certification, and treadwear provisions which will be acted on when comments have been considered.

In consideration of the foregoing, amendments are made to Parts 571 and 574 of Title 49, Code of Federal Regulations. . . .

*Effective date:* March 1, 1975.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on February 7, 1974.

James B. Gregory  
Administrator

**39 F.R. 5190**  
**February 11, 1974**



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119**

## **New Pneumatic Tires for Vehicles Other Than Passenger Cars**

**(Docket No. 71-18; Notice 7)**

This notice amends Standard No. 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, to specify lettering sizes and modified treadwear indicator requirements for tires. In addition, it amends Part 574, *Tire Identification*, 49 CFR 574, to permit the labeling of certain tires with the symbol DOT prior to the effective date of the standard. This notice also responds to petitions for reconsideration of Standard 119's effective date by maintaining the present date of March 1, 1975.

To avoid a costly production shutdown on the effective date to engrave tire molds with the DOT compliance symbol required by the standard, the National Highway Traffic Safety Administration (NHTSA) proposed a modification of the Part 574 prohibition on the symbol's use prior to the effective date (39 F.R. 3967, January 31, 1974). The Rubber Manufacturers Association and five tire manufacturers agreed that the DOT should be engraved on tire molds prior to the effective date, but objected to the expense of covering the DOT with a label stating that "no Federal motor vehicle safety standard applies to this tire," when the DOT appears on tires which (presumably) satisfy Standard 119 requirements. Firestone pointed out that the large label size could obscure other label information. Goodrich noted that, as proposed, the DOT could be molded on tires which met no standard and could mislead a user if the label fell off.

The NHTSA will not permit the appearance of the DOT compliance symbol on any item of motor vehicle equipment to which no standard is applicable. The terms "applicability" and "applies" have only one meaning for Federal motor vehicle safety standards: that the vehicle

or equipment concerned is subject to a safety standard. To permit use of the DOT symbol on vehicles or items of motor vehicle equipment to which no standard applies would confuse the meaning of the symbol and the concept of compliance.

In response to Firestone and Goodrich, the NHTSA has modified the lettering size on the label and limited use of the DOT symbol to tires for which a standard has been issued. With the small lettering size, the rubber labels used on retread tires can be applied over the DOT symbol in fulfillment of the requirement. Another method which manufacturers did not mention but which would be permissible is the removal of the DOT at the same time imperfections are buffed off the tire.

All comments on the proposal objected to the specific location requirements for treadwear indicators based on the concept of even tread wear across the tread width. Goodyear demonstrated in a meeting with the NHTSA Tire Division on February 13, 1974, and detailed in its submission to the Docket, the difficulty in equating ideal tire wear with actual road experience. They recommended the simpler concept that a tire has worn out when any major tread groove has only  $\frac{2}{32}$  in tread remaining. The NHTSA has concluded that treadwear indicators must be placed at the discretion of the manufacturer to give a person inspecting the tire visual indication of whether the tire has worn to a certain tread depth. Accordingly, the lateral location requirements for treadwear indicators have been deleted from the standard.

There was no discussion of the lettering size and depth proposal, and these proposals are adopted as proposed.



**Effective: March 1, 1975**

The comments requested reconsideration of the standard's March 1, 1975, effective date (published February 1, 1974, 39 F.R. 4087), asserting the need for 18 months of lead time following publication of this notice to engrave tire molds as required by the standard. The NHTSA has found that 11 months is sufficient leadtime to accomplish these changes, and accordingly these petitions are denied.

To correct an inadvertent omission in the amendment of Standard No. 119 in response to petitions for reconsideration (39 F.R. 5190, February 11, 1974), superscripts are added to Table III entries for "All other, A, B, C, D range tires".

In consideration of the foregoing, Parts 571 and 574 of Title 49, Code of Federal Regulations, are amended. . . .

*Effective date:* Standard No. 119 amendments: March 1, 1975. Part 574 amendment: April 3, 1974. Because the Part 574 amendment creates no additional burden, and because modification of tire molds must begin immediately, it is found for good cause shown that an effective date less than 180 days after issuance is in the public interest.

(Secs. 103, 112, 119, 201, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on March 28, 1974.

James B. Gregory  
Administrator

**39 F.R. 12104**  
**April 3, 1974**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119****New Pneumatic Tires for Vehicles Other Than Passenger Cars****(Docket No. 74-25; Notice 2)**

This notice amends the definition of "test rim" in 49 CFR 571.109 (Motor Vehicle Safety Standard No. 109) and modifies related provisions of that section and § 571.110 (Motor Vehicle Safety Standard No. 110). A conforming amendment is made to similar provisions in § 571.119 (Motor Vehicle Safety Standard No. 119). The notice of proposed rulemaking on which this amendment is based was published on July 10, 1974 (39 F.R. 25329).

The definition of "test rim" has previous to this amendment referenced the 1967 and earlier editions of publications of various foreign and domestic tire and rim associations as the source for determining rim specifications and appropriate tire/rim matching information for testing tires to the requirements of Motor Vehicle Safety Standard No. 109, and for equipping passenger cars pursuant to Motor Vehicle Safety Standard No. 110. The Rubber Manufacturers' Association petitioned that this reference be changed because the publications have become outdated in terms of the rim information they provide. This amendment, which adopts the proposed rule of July 10, 1974, in essentially the form proposed, deletes the references to the 1967 and earlier publications and substitutes for them the publications of the various associations current at the time of tire manufacture.

Under the amendment, a "test rim" will be any rim listed for use with a tire size designation in any of the current publications of the various foreign and domestic tire and rim associations. The listing will apply to all tires that fit the description (by tire size designation, use category, etc.) unless the publication itself or a separately published manufacturer's document states otherwise. A manufacturer wishing to except

any tire manufactured by him from any listing would be expected to request the association to publish the exception in its publication. If it does not, the manufacturer must himself publish the exception in his own listing, which he must distribute to his dealers, this agency, and to any member of the public on request. The language of the proposal is clarified, and a conforming amendment made to Standard No. 119 to show that an exception must be published in each association publication listing the tire and rim combination. The amendment further specifies that a "listing" of a rim must contain dimensional specifications, including diagrams, for the rim. This is necessary to provide for uniformity of rim dimensions and reflects the present practice of association publications of publishing such dimensional specifications. However, dimensional specifications or a diagram of a rim need not be included in manufacturers' separate listings if the specifications and diagram for the rim appear in each association publication where it is listed.

By referencing the current publications, the amendment ends the need for Appendix "A" of Standard No. 110, which lists tire/rim combinations approved for use subsequent to the 1967 and earlier associations publications. The associations and various manufacturers should ascertain that all tire/rim combinations presently listed in that Appendix are incorporated into at least one of their respective publications before the effective date of this amendment. Moreover, the addition of new tire/rim combinations subsequent to the effective date becomes the sole responsibility of the industry. Appendix "A" of Standard No. 109, listing tire size designations, is not affected by this amendment.

An effect of the amended definition of test rim is to clarify this agency's position that each tire must be able to pass each performance requirement (except that for physical dimensions) of Standard No. 109 with any rim with which it is listed, regardless of rim width, unless that tire is specifically excepted from each listing where it appears. The requirements for physical dimensions must be met only on a test rim of the width specified for the tire size designation in Standard No. 109. A tire failing the requirements on any test rim would be considered as having failed the requirements on all test rims. This continues existing NHTSA enforcement policy.

One of the two comments received regarding the proposal objected to this aspect of the amendment, arguing that some manufacturers have traditionally certified conformity on the basis of test results using only the test rims of the specified test rim width and that no safety problems had been encountered. The NHTSA believes, however, that the interest of safety demands that manufacturers ensure that tires certified as conforming to Standard No. 109 will conform to the standard's requirements on any rim which the manufacturer lists for use with the tire and with which the tire may consequently be used in service. This position has been reflected in the guidelines for the additions of new tire/rim combinations to the Appendix of Standard No. 110,

which have required that the manufacturer demonstrate conformity to Standard No. 109 on each newly requested rim. If a manufacturer doubts the ability of his tires to conform to the standard on certain recommended rims, he has the option of excepting his tires from being used with those rims. No other objections to the proposed rule were received.

In light of the above, amendments are made to 49 CFR §§ 571.109, 571.110, and 571.119 . . . .

*Effective date:* August 5, 1975 for Standards No. 109 and 110; March 1, 1975, for Standard No. 119. The amendment to Standard No. 119 is of a clarifying nature, and should be made effective with the existing effective date of that standard. The amendment does not require substantial leadtime for conformity, and it is found for good cause shown that an effective date less than 180 days from publication is in the public interest.

(Secs. 103, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. §§ 1392, 1407, 1421, 1422; delegation of authority at 49 CFR 1.51.)

Issued on January 31, 1975.

James B. Gregory  
Administrator

40 F.R. 5529  
February 6, 1975



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

### New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71-18, Notice 10)

This notice establishes a uniform tire testing temperature for the test requirements of the Uniform Tire Quality Grading regulation and the Federal motor vehicle safety standard for non-passenger-car tires. This amendment simplifies existing requirements by permitting various tire tests to be conducted at the same temperature.

*Effective date:* July 17, 1978.

*For further information contact:*

Arturo Casanova III, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1715).

*Supplementary information:* The National Highway Traffic Safety Administration (NHTSA) proposed on March 3, 1977, to amend the ambient temperature conditions for tire testing contained in Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (49 CFR 571.119), and in Part 575, *Uniform Tire Quality Grading* (49 CFR 575.104) (UTQG). The purpose of this proposed amendment was to harmonize existing tire testing temperatures as requested by the Goodyear Tire and Rubber Company. The ambient temperatures were previously specified as follows:

Standard No. 109: "100±5° F."

Standard No. 119: "any temperature . . . up to 100° F."

UTQG: "at 105° F."

In the notice of proposed rulemaking, the agency proposed to amend Standard No. 119 and UTQG to reflect the tire temperature utilized in Standard No. 109 (100±5° F.). As an alternative method of expressing the test temperature,

the NHTSA proposed to amend the standards to specify "any temperature up to 95° F."

Five comments were received in response to that proposal. All comments favored the proposed amendment that would have instituted a 100±5° F. temperature. The Vehicle Equipment Safety Commission did not take a position on this proposal.

After consideration of the issues involved in the proposal and review of the comments, the agency has determined that the test temperature should be expressed as "any temperature up to 95° F." Accordingly, Standard No. 119 and UTQG are amended to specify temperature testing at "any temperature up to 95° F." It is the NHTSA's opinion that the 95° F. test temperature is in effect the same test temperature as would be achieved by using the 5-degree tolerance (100±5).

The NHTSA has often stated in interpretations on similar issues that the use of tolerances in safety standards reflects a misunderstanding of the legal nature of the safety standards. Standards are not instructions, but performance levels that vehicles or equipment are required by law to be capable of meeting. Any tolerance in this context would be meaningless and misleading, since it would merely have the effect of stating a performance level that the equipment must meet when tested by the government, but in a confusing manner.

Recognizing that no measurement is perfectly precise, a manufacturer's tests should be designed to show, using tire testing temperature as an example, that his tires will comply with the requirements at exactly 95° F. This may be done in at least two ways: (1) by using a test method that corresponds so closely to the required tem-

perature that no significant differences could occur as a result of differences between the actual temperature and the specified one, or (2) by determining which side of the specified temperature is adverse to the product tested, and being sure that the actual temperature of the test differs from the specified one on the adverse side.

The amendment of Standard No. 119 and UTQG to reflect the 95° F. temperature creates a different temperature phraseology for those standards than exists in Standard No. 109 which still has the 100±5° F. temperature. As stated earlier, the NHTSA considers the Standard No. 109 temperature tolerance to mean in actuality "any temperature up to 95° F." However, since modification of that standard was not proposed in the earlier notice, the agency does not amend it in this final rule. However, the agency intends to issue an interpretive amendment that will amend Standard No. 109 to adopt the alternative expression for tire temperature testing (any temperature up to 95° F.) unless objections are received.

In accordance with Departmental policy encouraging analysis of the impact of regulatory actions upon the public and private sectors, the agency has determined that this modification will result in no appreciable safety gains or losses.

These amendments may result in slightly lower costs for tire temperature testing since all temperatures will be uniform.

Since these amendments relieve restrictions and impose no additional burdens, it is found for good cause shown that an immediate effective date is in the public interest.

In consideration of the foregoing, the following amendments are made in Parts 571 and 575 of Title 49, Code of Federal Regulations. . . .

The program official and lawyer principally responsible for the development of this rulemaking document are Arturo Casanova and Roger Tilton, respectively.

(Secs. 103, 112, 119, 201, 203, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1421, 1423); delegation of authority at 49 CFR 1.50.)

Issued on July 12, 1978.

Joan Claybrook  
Administrator

**43 F.R. 30541-30542**  
**July 27, 1978**

## MOTOR VEHICLE SAFETY STANDARD NO. 119

### New Pneumatic Tires for Vehicles Other Than Passenger Cars

**S1. Scope.** This standard establishes performance and marking requirements for tires for use on multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles.

**S2. Purpose.** The purpose of this standard is to provide safe operational performance levels for tires used on motor vehicles other than passenger cars, and to place sufficient information on the tires to permit their proper selection and use.

**S3. Application.** This standard applies to new pneumatic tires designed for highway use on multipurpose passenger vehicles, trucks, buses, trailers and motorcycles manufactured after 1948.

**S4. Definitions.** All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

“Light truck tire” means a tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

“Model rim assembly” means a test device that (a) includes a rim which conforms to the published dimensions of a commercially available rim, (b) includes an air valve assembly when used for testing tubeless tires or an innertube and flap (as required) when used for testing tube-type tires, and (c) undergoes no permanent rim deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber when a tire is properly mounted on the assembly and subjected to the requirements of this standard.

#### **S5. Tire and rim matching information.**

**S5.1** Each manufacturer of tires shall ensure that a listing of the rims that may be used with each tire that he produces is provided to the public. For purposes of this section, each rim

listing shall include dimensional specifications and a diagram of the rim. However, a listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of a rim if the rim's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b). The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Tire Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; or

(b) Contained in publications, current at the date of the manufacture of tire or any later date, of at least one of the following organizations:

The Tire and Rim Association.

The European Tyre and Rim Technical Organisation.

Japanese Industrial Standards.

Deutsche Industrie Norm.

The Society of Motor Manufacturers and Traders, Ltd.

British Standards Institution.

Scandinavian Tire and Rim Organisation.

**S5.2** Information contained in a publication specified in S5.1(b) which lists general categories of tires and rims by size designation, type of construction, and/or intended use, shall be considered to be manufacturer's information pursuant to S5.1 for the listed tires, unless the publication itself or specific information provided according to S5.1(a) indicates otherwise.

**S6. Requirements** Each tire shall be capable of meeting any of the applicable requirements set forth below, when mounted on a model rim



assembly corresponding to any rim designated by the tire manufacturer for use with the tire in accordance with S5. However, a particular tire need not meet further requirements after having been subjected to and met the endurance test (S6.1), strength test (S6.2), or high speed performance test (S6.3).

S6.1 Endurance.

S6.1.1 Prior to testing in accordance with the procedures of S7.2, a tire shall exhibit no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

S6.1.2 When tested in accordance with the procedures of S7.2:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressure specified in S7.2(a).

S6.2 Strength. When tested in accordance with the procedures of S7.3 a tire's average breaking energy value shall be not less than the value specified in Table II for that tire's size and load range.

S6.3 High speed performance. When tested in accordance with the procedures of S7.4, a tire shall meet the requirements set forth in S6.1.1 and S6.1.2(a) and (b). However, this requirement applies only to motorcycle tires and to non-speed-restricted tires of 14.5-in nominal rim diameter or less marked load range A, B, C, or D.

S6.4 Treadwear indicators. Except as specified below, each tire shall have at least six treadwear indicators spaced approximately equally around the circumference of the tire that enable a person inspecting the tire to determine visually

TABLE I—Strength Test Plunger Diameter

Tire type:	Plunger Diameter (inches)
Light truck _____	3/4
Motorcycle _____	5/16
Tires for 12-inch or smaller rims, except motorcycle _____	3/4
Tires other than the above types: Tubeless:	
17.5-inch or smaller rims _____	3/4
Larger than 17.5-inch rims:	
Load range F or less _____	1 1/4
Load range over F _____	1 1/2
Tube type:	
Load range F or less _____	1 1/4
Load range over F _____	1 1/2

TABLE II—Minimum Static Breaking Energy (Inch-Pounds)

Plunger diameter	5/16 Inch	3/4 Inch		1 1/4 Inch		1 1/2 Inch	
Tire characteristic	Motorcycle	All 12-inch or smaller rim size	-Light truck -17.5 inch or smaller Rim Tubeless	Tube type	Tubeless	Tube type	Tubeless
Load range							
A	150	600	2000	----	----	----	----
B	300	1200	2600	----	----	----	----
C	400	1800	3200	6800	5100	----	----
D	-	2400	4550	7900	6500	-	----
E	---	3000	5100	12500	8600	----	----
F	---	3600	5700	15800	12500	----	----
G	---	-	6300	----	----	20200	1500
H	--	----	6800	----	----	23000	18500
J	-	----	----	----	----	25000	19500
L	-	----	----	----	----	27000	----
M	---	-	----	----	----	28500	-
N	---	-	----	----	----	30000	-

For rayon cord tires, applicable energy values are 60 percent of those in table.

TABLE III—Endurance Test Schedule

Description	Load range	Test wheel speed (rpm)	Test load: Percent of maximum load rating			Total test revolutions (thousands)
			I 7 hrs.	II 16 hrs.	III 24 hrs.	
Speed-Restricted service						
55 m.p.h. _____	All _____	125	66	84	101	352.5
50 m.p.h. _____ )	C, D _____	150	75	97	114	423.0
_____ )	E, F, G, H, _____					
_____ )	J, L _____	100	66	84	101	282.0
35 m.p.h. _____	All _____	75	66	84	101	211.5
Motorcycle _____	All _____	250	<sup>1</sup> 100	<sup>2</sup> 108	117	510.0
All others _____ )	A, B, C, D, _____	250	<sup>1</sup> 75	<sup>2</sup> 97	114	510.0
_____ )	E _____	200	70	88	106	564.0
_____ )	F _____	200	66	84	101	564.0
_____ )	G _____	175	66	84	101	493.5
_____ )	H, J, L, N _____	150	66	84	101	423.0

<sup>1</sup> 4 hours for tire sizes subject to high speed requirements (S6.3)

<sup>2</sup> 6 hours for tire sizes subject to high speed requirements (S6.3)

whether the tire has worn to a tread depth of one-sixteenth of an inch. Tires with 12-inch or smaller rim diameter shall have at least three such treadwear indicators. Motorcycle tires shall have at least three such indicators which permit visual determination that the tire has worn to a tread depth of one-thirty-second of an inch.

**S6.5 Tire marking.** Except as specified below, each tire shall be marked on each sidewall with the information specified in paragraphs (a) through (j) of this section. The markings shall be placed between the maximum section width (exclusive of sidewall decoration or curb ribs) and the bead on at least one sidewall. The marking shall be in letters and numerals not less than 0.078 inches high and raised above or sunk below the tire surface not less than 0.015 inches, except that the marking depth shall be not less than 0.010 inches in the case of motorcycle tires. The tire identification and the DOT symbol labeling shall comply with Part 574 of this chapter. Markings may appear on only one sidewall and the entire sidewall area may be used in the case of motorcycle tires and recreational, boat baggage, and special trailer tires.

(a) The symbol DOT, which shall constitute a certification that the tire conforms to ap-

plicable Federal motor vehicle safety standards. This symbol may be marked on only one sidewall.

(b) The tire identification number required by Part 574 of this chapter. This number may be marked on only one sidewall.

(c) The tire size designation as listed in the documents and publications designated in S5.1.

(d) The maximum load rating and corresponding inflation pressure of the tire, shown as follows:

(mark on tires rated for single and dual load)

Max load single \_\_\_\_\_ lbs at \_\_\_\_\_ psi cold

Max load dual \_\_\_\_\_ lbs at \_\_\_\_\_ psi cold

(Mark on tires rated only for single load)

Max load \_\_\_\_\_ lbs at \_\_\_\_\_ psi cold

(e) The speed restriction of the tire, if 55 mi/h or less, shown as follows:

Max speed \_\_\_\_\_ mph

(f) The actual number of plies and the composition of the ply cord material in the sidewall, and, if different, in the tread area.

(g) The words "tubeless" or "tube type" as applicable.

(h) The word " regroovable" if the tire is designed for regrooving.

(i) The word "radial" if a radial tire.

(j) The letter designating the tire load range.

**S6.6 Maximum load rating.** If the maximum load rating for a particular tire size is shown in one or more of the publications described in S5.1(b), each tire of that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing published ratings for the same tire size designation, not less than the lowest published maximum load rating for the size designation.

## **S7. Test procedures.**

### **S7.1 General conditions.**

**S7.1.1** The tests are performed using an appropriate new tube, tube valve and flap assembly (as required) that allows no loss of air for testing of tube-type tires under S7.2, S7.3, and S7.4, and tubeless tires under S7.3.

**S7.1.2** The tire must be capable of meeting the requirements of S7.2 and S7.4 when conditioned at any ambient temperature up to 100° F. for 3 hours before the test is conducted, and with an ambient temperature maintained at any level up to 100° F. during all phases of testing. The tire must be capable of meeting the requirements of S7.3 when conditioned at any ambient temperature up to 70° F. for 3 hours before the test is conducted.

**S7.2 Endurance.** (a) Mount the tire on a model rim assembly and inflate it to the inflation pressure corresponding to the maximum load rating marked on the tire. Use single maximum load value when the tire is marked with both single and dual maximum load.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a) immediately before mounting the tire rim assembly.

(c) Mount the tire-rim assembly on an axle and press it against a flat-faced steel test wheel that is 67.23 inches in diameter and at least as wide as the tread of the tire.

(d) Apply the test load and rotate the test wheel as indicated in Table III for the type of tire tested conducting each successive phase of the test without interruption.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

**S7.3 Strength.** (a) Mount the tire on a model rim assembly and inflate it to the pressure corresponding to the maximum load, or maximum dual load where there is both a single and dual load marked on the tire. If the tire is tubeless, a tube may be inserted to prevent loss of air during the test in the event of puncture.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a).

(c) Force a cylindrical steel plunger, with a hemispherical end and of the diameter specified in Table I for the tire size, perpendicularly into a raised tread element as near as possible to the centerline of the tread, at a rate of 2 inches per minute, until the tire breaks or the plunger is stopped by the rim.

(d) Record the force and the distance of penetration just before the tire breaks, or if it fails to break, just before the plunger is stopped by the rim.

(e) Repeat the plunger application at 72° intervals around the circumference of the tire, until five measurements are made. However, in the case of tires of 12-in rim diameter or less, repeat the plunger application at 120° intervals around the circumference of the tire, until three measurements are made.

(f) Compute the breaking energy for each test point by the following formula:

$$W = \frac{FP}{2}$$

where

W = Breaking energy

F = Force in pounds, and

P = Penetration in inches.

(g) Determine the average breaking energy value for the tire by computing the average of the values obtained in accordance with (f).



#### **S7.4 High speed performance.**

(a) Perform steps (a) through (c) of S7.2.

(b) Apply a force of 88 percent of the maximum load rating marked on the tire (use single maximum load value when the tire is marked with both single and dual maximum loads), and rotate the test wheel at 250 rpm for 2 hours.

(c) Remove the load, allow the tire to cool to 100° F., and then adjust the pressure to that marked on the tire for single tire use.

(d) Reapply the same load, and without interruption or readjustment of inflation pressure, rotate the test wheel at 375 rpm for 30 minutes, then at 400 rpm for 30 minutes, and then at 425 rpm for 30 minutes.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

**38 F.R. 31299**

**November 13, 1973**



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 120

### Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71-19; Notice 3)

This notice establishes a new Federal Motor Vehicle Safety Standard No. 120, *Tire selection and rims for motor vehicles other than passenger cars*, 49 CFR 571.120, and amends 49 CFR Part 567, *Certification*. The new standard specifies tire and rim selection requirements for multi-purpose passenger vehicles (MPV's), trucks, buses, trailers, and motorcycles, and marking requirements for rims for use on these vehicles. It also adds tire and rim matching information to the items required to appear on such vehicles' certification labels. The amendment to Part 567 makes that regulation consistent with the new standard. The notice is based on proposals which were published August 3, 1971 (36 F.R. 14273) and June 3, 1974 (39 F.R. 19505).

The standard requires new vehicles (other than passenger cars, which are the subject of Standard No. 110) to be equipped with tires that comply with either Standard No. 109, *New Pneumatic Tires—Passenger Cars*, or Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars*. The tires must be fitted to rims which have been designated by the tire manufacturer, in accordance with S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as suitable for use with those tires. The designations are made by listing the tire-rim matching information in one of seven industry-maintained publications or by furnishing this information to dealers of the manufacturer's tires, to any person upon request, and to the NHTSA.

Each axle must be equipped with tires the sum of whose load ratings is not less than that axle system's Gross Axle Weight Rating (GAWR). In certain situations, discussed below, a vehicle may be equipped with used tires of adequate load rating that were originally

manufactured to comply with Standard No. 119. Adequacy is determined as follows: the sum of the maximum load ratings of the tires must be equal to or greater than the GAWR which is specified on the Part 567 certification label, with an exception discussed below. If the certification label lists more than one GAWR-tire combination for the axle, the sum of the tires' maximum load ratings must meet or exceed the GAWR that corresponds to the tires' size designation. If more than one combination is listed, but the size designation of the actual tires on the vehicle is not among those listed, then the sum of the load ratings must simply meet or exceed the lowest GAWR which does appear.

Rims must be marked with five items of information: the size designation (and, in the case of multipiece rims, the type designation), an indication of the source of the rim's nominal dimensions, and the DOT symbol must appear on the weather side, while identification of the manufacturer and date of manufacture may appear at any place on the rim's surface. The standard does not explicitly require that a rim conform to its published dimensions. If a rim's deviation from these nominal dimensions is so great that a safety hazard is presented, however, the defect notification and remedy provisions of the National Traffic and Motor Vehicle Safety Act of 1966, as amended, provide authority to deal with the hazard.

To reduce the possibility of confusion and to minimize the number of characters stamped on the rim, the standard establishes a set of code letters to indicate the source of the rim's nominal dimensions. "T", "E", "J", "D", "M", "B", and "S" indicate the industry publications listed in Standards Nos. 109 and 119, while "N" indicates



an independent listing with tire dealers and the NHTSA. The proposed requirement that the marking indicate the date of the publication has not been adopted because it does not appear necessary. The standard does not require manufacturers to be identified with a code number assigned by the NHTSA, because no action has been taken on the proposal published in the Federal Register on June 7, 1973 (38 F.R. 14968). The rim manufacturer is free to use his name, trademark, or a symbol of his choice. Because a rim's maximum load rating may be limited by its disc, this standard does not require that the maximum load rating be marked. The rim's maximum inflation pressure, while not affected by the choice of disc, is potentially misleading without additional marking of the disc. These rim markings are being considered in conjunction with further NHTSA rulemaking activity concerning wheels.

Several commenters objected to the proposed requirement of a tire-rim information label, separate from and adjacent to the certification label required by Part 567. Upon consideration of these comments, the NHTSA agrees that a separate placard is unnecessary. GVWR and GAWR are already required to appear on the certification label. If the required manufacturer exercises his option of listing more than one GVWR-GAWR combination, he is already required to indicate the proper tire size designations after each weight rating. Standard No. 120 further requires, for vehicles other than passenger cars, the following information to appear after each weight rating and tire size designation listed on the certification label: rim size designation, cold inflation pressure for the tires, and speed restriction (if any) for the tires. This information is now required to appear even when only one GVWR-GAWR combination is listed. The Part 567 label is thus expanded to include the information that would have appeared on the separate label described in S5.4 of the proposed Standard No. 120.

Many commenters pointed to the large number of possible axle-tire-rim combinations and suggested that the information label would be too large and confusing. Some discussed the vehicle

manufacturer's difficulty in ensuring that the required information appear, given the common practice of changing tires and rims after a new vehicle has been shipped to a dealer. These commenters appear to have misunderstood the various proposed and existing requirements. Part 567 does not, in its prior form or as amended today, require a listing for more than one GVWR-GAWR-tire combination. Further, while S5.1.2 of Standard No. 120 requires the tires with which a new vehicle is equipped to be of adequate load rating for the GAWR, and while S5.3 requires an indication of tires adequate for the GAWR, there is no requirement that the actual tires be listed on the certification label. The tire information on that label is intended as a guide which tells the user what replacement tires, *as a minimum*, are appropriate for the listed GAWR and what rims are appropriate for those tires.

Guerdon Industries, Inc., objected to the requirement that vehicles be restricted to the load limits molded on tire sidewalls. The pointed to the mobile home industry's practice of loading tires to 150 percent of their load ratings, and argued that this practice should be permitted to continue. Examination of data compiled by the Bureau of Motor Carrier Safety, however, shows that from 1969 to 1972 (the most recent years for which figures are available), tires accounted for 18.0 percent of reported mobile home accidents. The NHTSA therefore rejects the proposition that such overloading does not present a safety hazard. There is no exception to the requirement that all vehicles be equipped with tires of adequate load rating.

Some commenters requested that tire overloading be permitted under restricted speed conditions. These commenters appear to have misunderstood the scope of the standard. Vehicles-in-use are regulated by the States and by the Bureau of Motor Carrier Safety. Standard No. 120 does not prohibit the overloading of tires in speed-restricted service, or otherwise regulate the use of tires or vehicles. The GVWR and GAWR information on the certification label is based on unrestricted service.

The formula described above for tire selection is subject to an exception for MPV's, trucks, buses, and trailers which are equipped with passenger car tires. The combined maximum load rating of the passenger car tires on an axle must be equal to or greater than 110 percent of the axle's GAWR. Some comments supported this exception as it was proposed. Others suggested that passenger car tires be permitted on such vehicles without the 110% factor, while the RMA and others argued that passenger car tires should not be permitted on trailers at all. The NHTSA rejects the argument that the 110% correction factor is unnecessary. Because non-passenger-car service on the average puts greater stresses on a tire (for example, trucks and trailers are driven at or near their maximum rated loads more often than passenger cars), a given load rating for a Standard No. 109 tires does not have the same meaning as the identical load rating for a Standard No. 119 tire. Conversely, the NHTSA has found no evidence that passenger car tires are inadequate for trailer service when the load correction factor is applied. The 110 percent factor is therefore adopted as proposed.

As proposed, the standard included an exception to the requirement that new vehicles be equipped with new tires conforming to Standard No. 109 or 119. Used tires were to be permitted on a truck, bus, or trailer (other than a mobile structure trailer) under the following conditions: the tires were originally manufactured to comply with Standard No. 119; they were of adequate load rating; they were owned or leased by the purchaser; and they were installed on the new vehicle at its place of manufacture at the purchaser's request. Comments on this exception were generally favorable, although one mobile home manufacturer objected to the exclusion of mobile structure trailers. The exception was intended to accommodate commercial delivery practices in the truck, bus, and trailer industry. While fleets which lease tires on a mileage-contract basis or which install their own used tires on new vehicles are in a good position to know the condition of these tires, the mobile home purchaser has no knowledge of the history of used tires installed on his vehicle. The proposed exception to the new tire requirement is therefore not extended to include all mobile

structure trailers. It is, however, extended to include those delivered to the purchaser by a motor carrier, because a motor carrier (who is subject to Bureau of Motor Carrier Safety regulations) can be expected to be more familiar with tire safety needs than a typical purchaser. To clarify the proposed language, "originally manufactured to comply with Standard No. 119," the words "as evidenced by the DOT symbol" have been added to the text of the standard.

Several commenters pointed out that certain vehicles are designed for non-uniform side to side loading, and suggested that the proposed method of determining the necessary tire load rating from the GAWR (dividing GAWR by the number of wheel positions on the axle) is inadequate for such vehicles. These commenters argued that tire load rating should be based on the maximum wheel load, rather than on the GAWR. The standard issued today does not specify the maximum load rating to be exceeded by each tire on any given axle. Instead, it requires the sum of those load ratings to meet or exceed the GAWR. The manufacturer of an asymmetrically designed vehicle can therefore equip an axle with tires of differing load ratings. The NHTSA agrees that each tire should be capable of carrying its maximum expected wheel load. At this time, however, the NHTSA considers its defect authority, combined with the new standard, adequate to ensure that vehicles are equipped with such tires.

Definitions have been added to clarify the meaning of "rim base," "rim size designation," "rim type designation," "rim diameter," "rim width," and "weather side." Definitions suggested for other terms have not been included in the standard because the meanings have been found to be widely understood or self evident.

Many comments pointed out problems with a single effective date. For example, for marked rims to be available to vehicle manufacturers in time, and interval is necessary between the effective dates for the rim marking requirement and the requirement that vehicles be equipped with rims that comply with the standard. Similarly, to require all used tires, otherwise permitted by S5.1.3 to have originally been manufactured to

**Effective: August 1, 1976**  
**September 1, 1976**

comply with Standard No. 119 would, without a delay in the effective date, cause the waste of pre-Standard No. 119 tires of adequate load-carrying capacity. Accordingly, a staggered system of effective dates is established as set out below.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended....

*Effective dates:* For the amendment to Part 567: September 1, 1976. For Standard No. 120: August 1, 1976, for the rim marking requirements (S5.2), and September 1, 1976, for the

remaining requirements except as otherwise provided in the standard.

(Secs. 103, 112, 114, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on January 19, 1976.

James B. Gregory  
Administrator

**41 F.R. 3478**  
**January 23, 1976**



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120**

## **Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars**

**(Docket No. 71-19; Notice 4)**

This notice delays the effective dates of certain requirements of Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars, and of the conforming amendment to 49 CFR Part 567, Certification, that was issued along with the standard. Its purpose is to permit manufacturers to avoid the burden of preparation for compliance with requirements that the NHTSA has determined should be amended. There is no delay, however, in the standard's basic tire and rim selection requirements, which become effective September 1, 1976.

Standard No. 120 (49 CFR § 571.120) was issued on January 19, 1976 (41 FR 3478; January 23, 1976; Notice 3). It specifies requirements for tire and rim selection, rim marking, and the provision of tire and rim information on vehicle certification labels. Part 567, the certification regulation, was amended in the same FEDERAL REGISTER notice, to accommodate the additional labeling.

Manufacturers are expected to begin preparations for compliance with a standard at the time a final rulemaking notice is issued. Lead times are established in accordance with this expectation, despite the possibility of future amendments. Fifteen petitions for reconsideration of Standard No. 120 have been received. From the petitions and other information available to this agency, the NHTSA has determined that certain provisions of the standard should be amended. However, the agency finds it impracticable to respond to the petitions by May 24, 1976, the date by which a response would be expected under its policy regarding such responses (49 CFR Part 553, Appendix). The agency plans to respond to the petitions not later than July 1, 1976. Without a delay of certain effective dates, manufacturers would be forced to make prepara-

tion for compliance with requirements that will, in all likelihood, be changed.

Accordingly, this notice changes from September 1, 1976, to September 1, 1977, the effective date of the requirement, found in S5.3, that certain information appear on a vehicle's certification label. The effective date of the conforming amendment to Part 567, *Certification*, is similarly changed to September 1, 1977. The effective date of S5.2, *Rim Marking*, is changed from August 1, 1976, to August 1, 1977. The date by which vehicles must be equipped with rims that are marked in accordance with the standard, which is presently specified in S5.1.1 as March 1, 1977, is changed to September 1, 1979. The NHTSA is considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available.

Manufacturers should note that, apart from the changed effective date for the requirement in S5.1.1 that vehicles be equipped with properly marked rims, there is no delay in the September 1, 1976, effective date of the standard's basic requirement, S5.1 (*Tire and Rim Selection*).

The symbol "DOT" is required by S5.2(c) to appear on every non-passenger-car rim manufactured on or after the effective date of the rim marking requirements, as a certification by the manufacturer of the rim that it complies with all applicable Federal motor vehicle safety standards. Several manufacturers have requested permission to begin stamping the symbol on rims that otherwise comply with the standard, before that effective date. In the past, the NHTSA has in similar situations taken the position that such use of the DOT symbol to indicate "anticipatory compliance" would necessarily be a false

or misleading certification, because no standard would in fact be in effect at the time of its use.

The agency has determined that a limited relaxation of this principle will not adversely affect its enforcement authority, yet will both foster early compliance with impending requirements and ease manufacturer's difficulties in transition to new production procedures. Accordingly, the NHTSA will not consider the use of the symbol "DOT" on an item of motor vehicle equipment that is not subject to any applicable and effective standard to be "false or misleading" if the following conditions are met: (i) there has, as of the date of manufacture of the item of equipment, been issued as a final rule a Federal motor vehicle safety standard to which the item of equipment would, but for that date's being earlier than the standard's effective date, be subject; and (ii) the item of equipment meets all requirements set out in the standard as most recently published before the date of manufacture of the equipment. The NHTSA will continue to consider other, unauthorized uses of the symbol to be "false or misleading in a material respect" within the meaning of Section 108(a)-(1)(C) of the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1398(a)(1)(C)).

This interpretation will permit the requested stamping that is discussed above. It will not permit the restamping, requested by several manufacturers, of previously manufactured rims that are in stock. These latter requests, however, are no longer of practical significance because of the other actions taken in this notice.

In consideration of the foregoing, the effective date of the amendment to 49 CFR Part 567, *Certification*, that was published on January 23, 1976 (49 FR 3478) is changed from September 1, 1976, to September 1, 1977, and changes are made to 49 CFR § 571.120 (Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*) . . . .

*Effective date:* These changes in the text of the Code of Federal Regulations should be made immediately.

(Sec. 103, 112, 114, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on April 29, 1976.

Robert L. Carter  
Acting Administrator

41 F.R. 18659  
May 6, 1976

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120****Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars****(Docket No. 71-19; Notice 5)**

This notice amends Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars (49 CFR 571.120), to permit until February 28, 1977, the equipping of new non-passenger-car vehicles with tires that do not meet certain tire labeling requirements but that otherwise meet all requirements of Standard No. 119 (New Pneumatic Tires for Vehicles Other Than Passenger Cars).

Standard No. 120 was issued on January 19, 1976 (41 FR 3478; January 23, 1976; Docket No. 71-19, Notice 3). It specifies tire and rim selection requirements for multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and marking requirements for rims for use on these vehicles. It also adds tire and rim matching information to the items required to appear on such vehicles' certification labels. A staggered sequence of effective dates was set out in Notice 3, beginning with September 1, 1976.

In Notice 4 (41 FR 18659; May 6, 1976), the NHTSA delayed several of these effective dates, to permit manufacturers to defer preparation for compliance with the corresponding requirements pending action on petitions for reconsideration of Notice 3. The NHTSA expects to respond to these petitions in the near future. Notice 4 did not, however, change the basic September 1, 1976, effective date of the tire and rim selection requirements of S5.1. Beginning on that date, S5.1.1 of Standard No. 120 would require, with an exception that is not relevant here, new non-passenger-car vehicles to be equipped with tires that meet either Standard No. 109 (which is applicable to passenger car tires) or Standard No. 119 (which is applicable to all other tires). The practical effect is to require most such vehicles to be equipped with

Standard 119 tires, because Standard 109 tires are appropriate for use only on certain non-passenger-car vehicles.

Standard No. 119 became effective on March 1, 1975, with an option to delay implementation of its labeling requirements until March 3, 1975 (see 40 FR 8188; February 26, 1975).

The NHTSA has received petitions for rule-making from International Harvester (IH) and Ford Motor Company. International Harvester indicated that, in anticipation of the recent strike against the nation's four largest tire manufacturers, it had accumulated an excess inventory of "pre-Standard 119 tires." IH stated that these tires meet the performance requirements of Standard No. 119 but not the labeling requirements. It petitioned for a six-month delay of the September 1, 1976, effective date of Standard No. 120's tire selection requirements, to permit the orderly depletion of this inventory.

Ford's petition focused on the difficulty, due to the strike, in obtaining in the near future sufficient quantities of tires that comply fully with Standard No. 119. Ford indicated that there are similar pre-Standard 119 tires available to it. It petitioned for an amendment to Standard No. 120 to permit the use of such insufficiently labeled tires.

The NHTSA believes that the approach suggested by Ford, because it will provide the necessary relief while preserving the required level of performance, is preferable to a simple delay of the September 1, 1976, effective date. Safety of performance of such tires or of vehicles equipped with them is thus not a major issue. The NHTSA has determined that, while granting the relief requested by these petitions may temporarily make enforcement by this agency



Effective: August 27, 1976

more difficult and may postpone the availability of certain tire labeling information to users of new vehicles subject to Standard No. 120, the avoidance of a serious disruption in the truck manufacturing process in this situation is appropriate and in the public interest. Accordingly, this notice adds a new section to Standard No. 120 that permits, for six months, the use of tires that are not properly labeled but otherwise meet all requirements of Standard No. 119.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200; April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. This action imposes no new economic or environmental costs. It creates the benefit of avoidance of serious economic disruption. In light of this benefit and the fact that the required level of tire performance is preserved, any loss in safety benefits would be insignificant in this case.

Because of the imminent effective date of a requirement which would otherwise lead to serious economic disruption, the NHTSA for good cause finds that notice and public procedure on this amendment are impracticable and contrary to the public interest.

In consideration of the foregoing, 49 CFR 571.120 (Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars) is amended by the addition of a new section. . . .

*Effective date:* August 27, 1976. Because this amendment relieves a restriction, it is found, for good cause shown, that an immediate effective date is in the public interest.

(Secs. 103, 112, 114, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on August 27, 1976.

Robert L. Carter  
Acting Administrator  
**41 F.R. 37115**  
**September 2, 1976**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

### Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71-19; Notice 6; Docket No. 75-32; Notice 2)

This notice responds to petitions for reconsideration of the newly established Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*, by amendments to the standard in the areas of tire and rim selection, rim making, and tire label information. A minor amendment of Part 567, "Certification," is also made. In addition, the decision that the agency no longer regulates mobile structure trailers (mobile homes) is also set forth, along with appropriate conforming amendments of Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and § 571.3, *Definitions*, of Part 571.

Standard No. 120 (49 CFR 571.120) establishes that multipurpose passenger vehicles (MPV's), trucks, buses, motorcycles, and trailers shall be equipped with tires and rims that are adequate to support the fully loaded vehicle under contemplated operating conditions. The legislative history of the National Traffic and Motor Vehicle Safety Act (the Act) (15 U.S.C. 1381, et seq.) and § 202 of that Act establish Congress' concern that motor vehicles could be equipped with inadequate tires and that regulation would be necessary to protect against this problem:

Sec. 202. In standards established under title I of this Act the Secretary shall require that each motor vehicle be equipped by the manufacturer or by the purchaser thereof at the time of the first purchase thereof in good faith for purposes other than resale with tires which meet the maximum permissible load standards when such vehicle is fully loaded with the maximum number of passengers it is designed to carry and a reasonable amount of luggage.

Standard No. 120 was promulgated January 19, 1976 (41 FR 3478, January 26, 1976), and 17 petitions for reconsideration of particular provisions were filed by vehicle, tire, and rim manufacturers, and by trade associations representing these manufacturers. In view of the length of time that has been taken to respond to these petitions for reconsideration, the effective dates for implementation of several of the standard's provisions were delayed (41 FR 18659, May 6, 1976) (41 FR 36657, August 31, 1976). The standard's basic provision for tire and rim selection (§5.1) was not delayed and became effective September 1, 1976.

*Tire and rim selection.* The primary effect of Standard No. 120 is fulfillment of § 202 of the Act by specification of the minimum load-carrying characteristics of tires on motor vehicles not already subject to the passenger car tire and rim selection requirements of Standard No. 110, *Tire Selection and Rims*, of Part 571. The rim selection requirements of the standard are limited (use of a rim designated as suitable by the tire manufacturer for use with its product; use of "DOT" labeled rims on and after September 1, 1979) in anticipation of more comprehensive regulation of rims as part of an upcoming wheel standard.

Tire selection consist of two elements: With one exception, each vehicle must be equipped with tires that comply with Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (or Standard No. 109, *New Pneumatic Tires*), and the load rating of the tires on each axle of the vehicle must together at least equal the gross axle weight rating (GAWR) for that axle. The term GAWR is defined in § 571.3 of Part 571 as "... the value

specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces." The GAWR concept formalizes the decision each manufacturer makes about the load-bearing ability of the tires, rims, axle, brakes, and suspension components (at a minimum) chosen to support and control the loaded vehicle.

The Truck Equipment Body Distributors Association (TEBDA) questioned the requirement that, with one exception, each vehicle subject to Standard No. 120 be equipped with tires that conform to Standard No. 119 (or Standard No. 109). TEBDA's March 17, 1976, letter concerned certification of trucks equipped for agricultural service with Goodyear "Terra-Tires." The "Terra-Tire" is one example of tires that are placed on specialized motor vehicles which operate both on and off the highway. The tires are specially designed and are unable to be certified to either of the tire performance standards.

Section S5.1.1 specifies that "each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirement of [the tire] standard[s]. . . ." This language is intended to exclude from the requirement for Standard 119 (or 109) tires of those vehicles which the manufacturer (or person later in the chain of distribution) decides to equip with tires other than "tires for highway service." The decision is left with the manufacturer at this time in view of the absence of data that demonstrates problems in the use of these tires that would justify their elimination. Any pattern of accident occurrence that points to unsafe utilization of non-highway service tires would presumably constitute a safety-related defect and could lead to revision of Standard No. 120 to regulate them. At this time, the answer to TEBDA is that the tire selection requirements of S5.1.1 (and S5.1.2 as a logical extension of S5.1.1) would not apply to a vehicle equipped with non-highway service tires. It is emphasized that this exclusion from Standard No. 120 bears no direct relationship to the determination of whether a particular vehicle qualifies as a "motor vehicle" as that term is defined in § 102(3) of the Act.

The second requirement for tire selection (S5.1.2) is that "[t]he sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system. . . ." Comparable further specification exists when multiple ratings appear on the certification label, or the tires used on the vehicle are not listed on the certification label.

Because no petition directly raised objections to the requirements of S5.1.2, the agency first addresses issues raised in a separate and outstanding NHTSA proposal dealing with tire choice and its relationship to GAWR. The action (Definition of "Gross Axle Weight Rating," 40 FR 58152, December 15, 1975) proposed that the GAWR determination be based on, among other things, the vehicle's maximum attainable speed or the maximum load rating of the tire established by the tire manufacturer at 60 mph, whichever is lower. The proposed modification was intended to reflect the industry practice of assigning (in most cases) and labeling (in accordance with Standards 119 and 109) a tire's basic load-carrying capabilities in recognition of the unrestricted highway speeds to which it is normally exposed. This formalization of GAWR determination was intended to prevent manufacturers from assigning higher capabilities to tires than their 60-mph ratings, based on arbitrarily low speeds.

Most comments supported the GAWR proposal, although several truck manufacturers asked that the term "maximum attainable speed" be specifically defined as it is elsewhere in NHTSA regulations. Ford Motor Company opposed the proposed change in the definition of GAWR as an arbitrary selection of only one of the many criteria that enter into the determination of GAWR. The company suggested that other means exist to prevent assignment of arbitrary GAWR's based on tire ratings other than those established at 60 mph and so labeled on the tire sidewall.

The NHTSA agrees with Ford and notes that the "other means" to regulate this practice exist in the tire selection requirements of S5.1.2 of Standard No. 120. At the time of the GAWR proposal, Standard No. 120 had not been made final. Since its implementation on September 1,



1976, a manufacturer is free to determine GAWR as in the past, but the maximum load ratings (marked on the tire sidewall) of tires on the vehicle must be at least equal the GAWR listed. For this reason, the NHTSA's proposal for amendment of the GAWR definition is considered unnecessary and is therefore withdrawn. Further notice and opportunity for comment will precede any further action on the proposal set forth in that notice.

Several issues were raised in regard to the GAWR proposal that should be addressed for purposes of clarification. The Heavy & Specialized Carriers Conference of the American Trucking Associations (HSCC) cautioned the NHTSA against requiring an "unrestricted speed GAWR" on the Part 567 certification label in view of two State laws (or regulations) that no vehicle can operate on the state highways at gross vehicle weights greater than those listed on the vehicle in accordance with Federal regulations. It is common practice to load some "heavy hauler" vehicles to a gross vehicle weight that exceeds the unrestricted speed ratings of the vehicle tires, because the vehicle's tires are capable of carrying greater weight at reduced speeds.

As issued, Standard No. 120 required that the maximum load ratings of the tires at least equal the GAWR. This effectively limits the GVWR to the sum of these GAWR's (except in the case of semi-trailers). In the agency's view, however, the problem cited by HSCC can be avoided by listing additional GAWR's (calculated for reduced speed operation) at the end of the certification plate following the required data on the label. This practice has been followed by members of the Truck Trailer Manufacturers Association (TTMA) and was confirmed as permissible by the NHTSA in a March 5, 1975, letter to the TTMA. In order to aid resolution of issues that may arise between States that wish to refer to the certification label and operators that wish to continue the additional rating system, the agency hereby makes an interpretive amendment to Part 567 to specify where additional ratings may appear.

Based on this understanding of the relationship between choice of tires under S5.1.2 of Standard No. 120 and the determination of

GAWR under § 567.4 of Part 567, a modification of the requirements of Standard No. 120 is justified. In the case of a vehicle that is incapable of the 60-mph speed used by tire manufacturers to establish the maximum load rating that is stamped on the tire sidewall (typically a powered vehicle and not a trailer), it would not be reasonable to require the GAWR's to be strictly limited to the sum of the maximum load ratings of the tires on the vehicle. This is because the vehicle will never achieve the speeds for which maximum load ratings were established. In many cases, provision is made to rate tires for a greater load at the lower (but maximum) speed of which a vehicle is capable. In recognition of this extremely limited specialized situation, the agency amends S5.1.2 to permit installation of tires with reduced speed capabilities in the case of vehicles whose maximum attainable speed is not greater than 50 mph. This amendment is considered to be a technical adjustment of language to fully implement the intent of the final rule as it was established. A separate amendment of § 571.3 is made to establish the basis for determination of a vehicle's maximum attainable speeds.

Volkswagen raised a separate issue concerning the requirement that the sum of maximum load ratings at least equal the GAWR of the axle system. This provision, in the case of an MPV, truck, bus, or trailer that is equipped with passenger car tires, requires that the maximum load ratings on the tires be reduced by approximately 10 percent before calculating the sum. The purpose of this 10-percent reduction in tire rating is to account for the generally harsher treatment (impulse and surge loading in the case of MPV's off-road) to which the tires of a vehicle other than a passenger car are exposed that is not accounted for in passenger car tire ratings. Volkswagen requested data showing that MPV's actually experience more abusive treatment in use.

The MPV category is based in part on the existence of characteristics that make these vehicles less amenable to passenger car standards. If Volkswagen has data indicating that the two categories actually experience identical usage, the NHTSA would prefer to adjust the defini-

tion to ensure that these vehicles are subject to all passenger car standards. Until that time, the existing rationale for excusing these vehicles from some passenger car standards dictates the use of higher strength tires.

As earlier noted, the rim selection requirements of Standard No. 120 are not substantial, consisting of a requirement that the rims be listed by the tire manufacturer as suitable for use with its tires, and a requirement that, on and after September 1, 1979, the rims used on a vehicle be labeled as specified in S5.2 of the standard. The September 1, 1979, date for use of labeled rims replaced a March 1, 1977, date that proved impractical in view of large inventories of unlabeled rims that exist and will exist long after rim labeling is begun. In establishing the later effective date, the agency noted that it was considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available. Experience with phase-in of newly regulated equipment in other areas such as tires and brake hoses has demonstrated that the requirement for labeled equipment on and after a particular date can create substantial inventory and potential economic waste problems. In view of experience that the delay of labeling requirements has not substantially impeded certification verification and defect actions, the NHTSA has decided to withdraw the requirement (that appears as the last sentence of S5.1.1). It is noted that withdrawal of this requirement does not affect the requirement of S5.1.2 that rims be listed as suitable by the tire manufacturer for use with the tires with which the vehicle is equipped, or the requirement of S5.2 that rims be labeled with specified information.

*Mobile structure trailers.* With regard to the applicability of this standard and other standards as a general matter, the NHTSA takes this opportunity to publish in the *Federal Register* its conclusion that enactment of the National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the Mobile Home Act) impliedly repealed this agency's authority to regulate mobile homes.

This conclusion was announced in a May 5, 1976, letter to the Department of Housing and Urban Development that stated in relevant part:

The National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the "Mobile Home Act") established within the Department of Housing and Urban Development a comprehensive program for the regulation of mobile homes. We have concluded that one result of that statute's enactment was the implied repeal of the NHTSA's authority with respect to mobile homes. Accordingly, we consider that the enactment has the effect of amending the Vehicle Safety Act's definition of "motor vehicle" to exclude "mobile homes" as the latter term is defined in the Mobile Home Act.

The effect of this conclusion is that tire and rim selection for mobile homes (known as "mobile structure trailers" by the NHTSA) is no longer subject to Standard No. 120 or other regulations issued under authority of the Act. For this reason, references to "mobile structure trailer" in Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and the general definitions section of Part 571 (§ 571.3) are deleted.

On the same subject, a May 25, 1976 (and supplementing July 7, 1976), letter from Firestone to the NHTSA asked whether tires manufactured exclusively for mobile homes and tires that are used on mobile homes (although manufactured for other uses) are subject to regulation under the Act. Similar questions were raised as to the status of rims, some of which are designed exclusively for use on mobile homes and some of which are used on mobile homes and other vehicles.

As for tires, Standard No. 109 applies to "tires for use on passenger cars" and Standard No. 119 applies to "tires designed for highway use on [specified motor vehicles]." By these terms, neither standard applies to tires designed exclusively for use on mobile homes. In the case of tires actually used on mobile homes but designed for use also on vehicles subject to the Act, the agency considers such tires to be subject



to the standards' requirements because they constitute motor vehicle equipment as that term is defined in § 102(4) of the Act.

As for rims, Standard No. 110 contains specifications only for rims that equip passenger cars and therefore contains no requirements that would directly require performance of a rim that was installed on a mobile home. Standard No. 120 applies to rims "for use on" MPV's, trucks, buses, motorcycles, and trailers (other than mobile structure trailers) and therefore would not apply to rims designed exclusively for use on mobile homes. In the case of rims designed for use on any of the motor vehicle types listed, the NHTSA would consider Standard No. 120's requirements applicable, and labeling in accordance with S5.2 would be required.

*Rim marking.* The second requirement of Standard No. 120 is an equipment requirement specifying five items of information (six in the case of multipiece wheels) that must appear on any rim for use on MPV's, trucks, buses, trailers, or motorcycles. The requirements for location of the information varies according to the type of information and whether the rim is part of a single or multipiece wheel. In answer to a question raised by Kelsey-Hayes and Motor Wheel, it is confirmed that these marking requirements have no bearing on the use of the rim on passenger cars, except as future labeling requirements in Standard No. 110 might prohibit one or more of the items required by S5.2. This eventuality is considered to be extremely unlikely.

Based on a comprehensive review of the petitions for reconsideration, the agency has decided that some requested modifications in labeling requirements are justified. The Japanese Automobile Manufacturers Association and Suzuki asked that required labeling be permitted to be embossed as well as impressed on the rim. Volkswagen (and representatives from Motor Wheel and Goodyear in a February 4, 1976, meeting with the NHTSA) asked that rim labeling be permitted on the disc portion of a single-piece wheel. The agency considers these suggestions to constitute justifiable options that would not diminish the level of motor vehicle safety represented by the standard, and the standard is accordingly amended.

Motor Wheel requested amendment of the standard to state that labeling of multipiece rims is permitted in the bolt hold area. The agency does not consider the addition of advisory information to be a desirable drafting practice because the mention of bolt hole locations would imply that some restriction on location exists when in fact it does not. In answer to another question from Motor Wheel, more than one "rim type designation" on rim components of a multipiece wheel is permitted by the standard.

Motor Wheel and Goodyear also asked if numbers that contain decimals or "trailing zeroes" e.g., 7.50) could be shortened by deleting the decimal and "trailing zero." The agency believes that abbreviation by dropping the zero will not be confusing and amends the standard to include an example of such abbreviation. Confusion would result from dropping the decimal.

In response to a request by Motor Wheel and Budd Company for a specific provision in S5.1.2 that the marking requirements only apply to newly manufactured wheels, the agency notes the general applicability statement in § 571.7, governing the applicability of all standards found in Part 571, states that ". . . each standard set forth in subpart B of this part applies according to its terms to all motor vehicles or items of motor vehicle equipment the manufacture of which is completed on or after the effective date of the standard." Thus, the standard only applies to rims manufactured on or after the effective date of S5.2.

Manufacturers asked for several revisions of the marking requirements which the agency has considered and concludes are unjustified. This discussion treats the requests in the order that the markings in question appear in S5.2.

With regard to the requirement for marking with a designation that indicates the source of the rim's published dimensions (S5.2(a)), Daido Corporation asked whether the Japanese Industrial Standards' symbol (a stylized combination of the letters J, I, and S) or the letters "JIS" would meet the requirements of S5.2(a)(3) for use of letter "J." The agency interprets its labeling requirements as strictly as any other portion of its requirements and concludes that



neither "JIS" nor the JIS symbol would conform to the requirement of S5.2(a)(3). In response to a similar request by Volkswagen to permit "DIN" in place of "D," the agency has considered the idea of permitting the manufacturer the option of a choice of designations, and concludes they are undesirable in the interests of maintaining uniformity and comprehension.

Grove Manufacturing suggested that the single letter designations of "D" and "E" could be mistaken for the load ranges that appear on tires and on the certification label. The agency concludes that the designations on the rim are sufficiently separated to preclude confusion and therefore the recommendation by Grove is not undertaken.

The "rim size designation" required by S5.2(b) is defined in S4 to mean the rim diameter and width. Daido and Volkswagen asked that a width designation followed by a diameter designation be considered as satisfying the requirement for designation of diameter and width. The agency specified the existing order to distinguish rim designations from tire designations. This order of information is being considered as the uniform practice to be adopted by the International Standards Organization. For reasons of uniformity, the requests are denied.

Volkswagen asked that the "DIN" symbol be permitted to signify compliance of the rim with Standard No. 120 in place of the "DOT" symbol required by S5.2(c) for this purpose. The agency does not find that the requirement of § 114 of the Act for certification is satisfied by use of a designation that has a wholly different meaning. Volkswagen's request is therefore denied.

*Certification label.* The third requirement of Standard No. 120 is that information about suitable tires and rims for use on the vehicles, along with appropriate inflation pressure and speed restriction information, be placed on a label on the vehicle (S5.3). As amended April 29, 1976 (41 FR 18659, May 6, 1976), the standard requires that the information appear on the certification labels of vehicles manufactured on or after September 1, 1977.

Some manufacturers and the Truck Trailer Manufacturers Association (TTMA) objected to the provision of this information on grounds that valid information already appears on the tires and rims that equip the vehicle, and that the information could mislead a person to think that only the listed tires and rims could be used on the vehicle. With regard to the first objection, the NHTSA disagrees and notes that an improper choice of tires or rims (as could occur by replacing original equipment with "custom" rims or the equivalent in tires) could permanently mislead vehicle owners as to the suitable selection of tires and rims. As for the possibility of misleading, the agency believes that a heading over the tire-rim listings (specifically, "SUITABLE TIRE-RIM CHOICE") can be added to the requirements for optional use by a manufacturer who believes the information would be otherwise misleading. With regard to General Motors' note that an owner should be guided by all available information on tire choice (e.g., information in the owner's manual), the agency notes its longstanding position that manufacturers may add statements referring the reader to other publications for additional information.

It is apparent from the examples cited by manufacturers that the decision to place all required data on the certification label could prove cumbersome in some cases, particularly those involving a heavy truck with several available axle combinations. In view of these problems, the agency has decided to remove the restriction on location and permit the information to appear on the certification label or on a separate label that conforms to the requirements for certification labels. The NHTSA notes that this option to provide information on a separate label responds to concern of the Truck Body and Equipment Association (TBEA) for the responsibilities of its final-stage manufacturing membership. The agency does not believe the tire and rim information would be as useful in a location entirely separate from the certification label, and it therefore declines to adopt General Motors' suggestion to use the Vehicle Identification label.

Motorcycle manufacturers and General Motors pointed out that the requirements for listing tire and rim information after GVWR in the case of vehicles such as motorcycles, that only utilize one GVWR listing, is redundant and therefore wasteful of space. Other manufacturers suggested that the tire-rim information was redundant in the case of multiple GVWR listings, although this is not the case because of the need to associate the appropriate GVWR with GAWR's that may exceed the GVWR. In any event, these comments suggest that GVWR and GAWR could be better linked by revision of the example format to reduce the amount of information that must be listed. The solution is to permit listing of the GVWR alone, followed immediately by corresponding GAWR's and appropriate tire-rim information. The clearer format would be used for single and multiple listings. This revision is described in the new example that accompanies the rule changes at the end of this notice. In conformity with this simplification, the rule is also amended to delete the requirements for GVWR tire-rim-inflation listings. Depending on manufacturers' reactions to the simplified format, a similar change could be undertaken for the passenger car example found in Part 567 (§ 567.4(h)(1)).

With regard to the items of information that must be listed in accordance with S5.3, General Motors and the TTMA argued that "tires . . . appropriate *as a minimum* for the GAWR" [emphasis added] could be construed to require tires with load ratings less than those that the manufacturer would choose to recommend. To eliminate any ambiguity, the agency replaces "at a minimum" with "as specified by S5.1.2."

Suzuki asked whether "cold inflation pressure" means the maximum inflation pressure specified by the tire manufacturer. The TTMA also asked for clarification on this point. The answer is that the requirement does not call for maximum pressure, but the pressure specified by the tire manufacturer as sufficient to carry the load specified by the vehicle manufacturer as the tire's share of the assigned GAWR.

Michelin Tire Corporation noted that listing inflation pressure could be misleading in the case of tire designations that call for different inflation pressures depending on the tire construc-

tion. It is the agency's view that any possibility of confusion can easily be avoided by an indication that the tire designation represents a radial tire, so that a person substituting a non-radial tire size with the same designation is aware that the two tires are not identical.

The TBFA requested clarification of the term "maximum speed" as it appeared in the example that accompanied the final rule. The TBFA appeared to misunderstand the example as a reference to the speed capabilities of the vehicle instead of the speed restriction of the tires. The agency has in mind only the rare tire types constructed for transit buses and mining and logging operations and so designated. Goodyear and the TTMA appeared to have the same mistaken impression of the requirement.

Speed-restricted vehicles have now been addressed under S5.1.2. In view of the confusion that arose over the requirement, and the agency's assumption that the users of these tires are knowledgeable in the use of the tires, it has been decided to drop the requirement of S5.3(d) altogether.

The TTMA raised several other questions with regard to the information that appears along with the GAWR. In answer to these questions, the effective dates of the standard are such that the manufacturer will be required to list the information specified by S5.3 on and after September 1, 1977. Also, it is not permissible to "bracket" the GVWR and GAWR values for a particular vehicle by specifying the minimum and maximum values that any tire-rim choice could provide. Section 567.4 of Part 567 requires that the GVWR and GAWR's representing the manufacturer determination of the particular vehicle's characteristics must be listed.

The standard does not require the information specified in S5.3 to be listed alongside the additional GVWR's and GAWR's that a manufacturer might list at the end of its certification label as reduced speed ratings. Lastly, the agency does not agree that the GAWR ratings for a semi-trailer are not related to the trailer's GVWR. While the trailer's axles do not support the entire weight of the vehicle, it is still the case that the various GVWR's that could be assigned to a semi-trailer are affected by the

GAWR values that can be assigned, and that the GVWR probably differs depending on the GAWR value assigned. In this sense the GAWR's assigned to a semitrailer's axles do "correspond" to its GVWR.

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The new options, simplification, and reduction of marking and labeling requirements should make compliance with the standard less costly, while the changes are not expected to significantly reduce the level of motor vehicle safety. The exception for speed-restricted vehicles provided in S5.1.2 represents a correction of the requirements to reflect the agency's intent not to prevent the assignment of greater load-carrying capabilities to vehicles at lower speeds. Permitting this practice to continue will result in the avoidance of new costs in the economy.

In consideration of the postponement of effective dates already granted for rim marking and

the tire information labeling, the agency concludes that the present effective date schedule permits adequate time for compliance.

In view of the three notices that have modified the test of Standard No. 120, the entire standard (incorporating the amendments made by this notice) is published for the convenience of persons affected.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended. . . .

*Effective date:* Changes to the text of the *Federal Register* may be made immediately. The provisions of Standard No. 120 are in effect at this time, except as otherwise provided in the standard.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 28, 1977.

John W. Snow  
Administrator

**42 F.R. 7140**  
**February 7, 1977**



## MOTOR VEHICLE SAFETY STANDARD NO. 120

### Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

**S1. Scope.** This standard specifies tire and rim selection requirements and rim marking requirements.

**S2. Purpose.** The purpose of this standard is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size and type designation.

**S3. Application.** This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and to rims for use on those vehicles.

**S4. Definitions.** All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

“Rim base” means the portion of a rim remaining after removal of all split or continuous rim flanges, side rings, and locking rings that can be detached from the rim.

“Rim size designation” means rim diameter and width.

“Rim diameter” means nominal diameter of the bead seat.

“Rim width” means nominal distance between rim flanges.

“Rim type designation” means the industry or manufacturer’s designation for a rim by style or code.

“Weather side” means the surface area of the rim not covered by the inflated tire.

#### **S5. Requirements.**

##### **S5.1 Tire and rim selection.**

**S5.1.1** Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the

requirements of Standard No. 109 (§ 571.109) or Standard No. 119 (§ 571.119), and with rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as applicable.

**S5.1.2** Except in the case of a vehicle which has a speed attainable in 2 miles of 50 mph or less, the sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system as specified on the vehicle’s certification label required by 49 CFR Part 567. If the certification label shows more than one GAWR for the axle system, the sum shall be not less than the GAWR corresponding to the size designation of the tires fitted to the axle. If the size designation of the tires fitted to the axle does not appear on the certification label, the sum shall be not less than the lowest GAWR appearing on the label. When a tire listed in Appendix A of Standard No. 109 is installed on a multipurpose passenger vehicle, truck, bus, or trailer, the tire’s load rating shall be reduced by dividing by 1.10 before calculating the sum.

**S5.1.3** In place of tires that meet the requirements of Standard No. 119 a truck, bus, or trailer may, at the request of the purchaser, be equipped at the place of manufacture of the vehicle with used tires owned or leased by the purchaser if the sum of the maximum load ratings meet the requirements of S5.1.2. On and after January 1, 1978, used tires employed under this provision must be originally manufactured to comply with Standard No. 119, as evidenced by the DOT symbol.

**S5.2 Rim marking.** On and after August 1, 1977, each rim or, at the option of the manufacturer in the case of a singlepiece wheel, wheel disc shall be marked with the information listed in paragraphs (a) through (e), in lettering not less than one-eighth inch high, impressed to a depth or, at the option of the manufacturer, embossed to a height of not less than 0.005 inch. The information listed in paragraphs (a) through (c) shall appear on the weather side. In the case of rims of multipiece construction, the information listed in paragraphs (a) through (e) shall appear on the rim base and the information listed in paragraphs (b) and (d) shall also appear on each part of the rim.

(a) A designation which indicates the source of the rim's published nominal dimensions, as follows:

(1) "T" indicates The Tire and Rim Association.

(2) "E" indicates The European Tyre and Rim Technical Organisation.

(3) "J" indicates Japanese Industrial Standards.

(4) "D" indicates Deutsche Industrie Norm.

(5) "M" indicates The Society of Motor Manufacturers & Traders, Ltd.

(6) "B" indicates British Standards Institution.

(7) "S" indicates Scandinavian Tire and Rim Organization.

(8) "N" indicates an independent listing pursuant to S4.4.1(a) of Standard No. 109 or S5.1(a) of Standard No. 119.

(b) The rim size designation, and, in case of multipiece rims, the rim type designation. For example: N 20 × 5.50, or N 20 × 5.5.

(c) The symbol DOT, constituting a certification by the manufacturer of the rim that the rim complies with all applicable motor vehicle safety standards.

(d) A designation that identifies the manufacturer of the rim by name, trademark, or symbol.

(e) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example,

"September 4, 1976" may be expressed as:

90476,	904	or	76
	76		904

"September 1976" may be expressed as:

976,	9	or	76
	76		9

**S5.3 Label information.** (For vehicles manufactured on and after September 1, 1977) The information specified in S5.3.1 through S5.3.3 shall, in the format set forth following this section, appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter, or at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of Part 567 of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

**S5.3.1** The size designation of tires (not necessarily those on the vehicle) appropriate (as specified in S5.1.2) for the GAWR.

**S5.3.2** The size designation and, if applicable, the type designation of rims (not necessarily those on the vehicle) appropriate for those tires.

**S5.3.3** Cold inflation pressure for those tires.

#### *Truck example*

#### SUITABLE TIRE-RIM CHOICE

GVWR: 17280

GAWR: Front—6280 with 7.50—20(D) tires,  
20 × 6.00 rims, at 75 psi cold single

GAWR: Rear—11000 with 7.50—20(D) tires,  
20 × 6.00 rims, at 65 psi cold dual.

GVWR: 17340

GAWR: Front—6300 with 7.00—20(E) tires,  
20 × 5.50 rims, at 90 psi cold single

GAWR: Rear—11040 with 7.00—20(E) tires,  
20 × 5.50 rims, at 80 psi cold dual.

**S6. Vehicles manufactured from September 1, 1976, to February 28, 1977.** Notwithstanding any other provision of this standard, a vehicle to which this standard applies that is manufactured during the period from September 1, 1976, to February 28, 1977, shall meet each requirement of this standard, with the following exception: In place of

tires that meet Standard No. 119 (§ 571.119), the vehicle may be equipped with tires that meet every requirement of that standard other than the tire marking requirements of S6.5 of that standard.

**41 F.R. 3478  
January 23, 1976**





**PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 121****Air Brake Systems—Trucks, Buses and Trailers****(Docket Nos. 70-16, 70-17; Notice No. 2)**

The purpose of this notice is to amend § 571.21 of Title 49, Code of Federal Regulations, by adding Motor Vehicle Safety Standard No. 121, Air Brake Systems—Trucks, Buses and Trailers. Notices of proposed rulemaking on this subject were published on June 25, 1970 (35 F.R. 10368) and June 26, 1970 (35 F.R. 10456). The comments received in response to the notices and information obtained at a technical conference held on October 20, 1970 (35 F.R. 14736, September 22, 1970) have been considered in the development of the final rule. The trailer requirements are joined with the truck and bus requirements in a single air brake systems standard.

The standard as adopted specifies requirements for the safe performance of air brake systems under normal and emergency conditions. It should be noted that the term "air brake system" as defined in the standard applies to the brake configuration commonly referred to as "air over hydraulic," in which failure of either medium can result in complete loss of braking ability.

The standard establishes a set of requirements to govern the braking behavior of a vehicle during application of the service brakes. Principal among these are stopping performance requirements that include a minimum stopping distance requirement for trucks and buses and lateral stability and wheel lockup requirements for all vehicles. To more accurately reflect the friction characteristics of a surface with a skid number of 75, the stopping distances for trucks and buses on a dry surface have been increased over those proposed in the notice. The required distance from 60 m.p.h. is now 245 feet rather than 216 feet and the distance from 20 m.p.h. is 33 feet rather than 29 feet. The stopping distance on a wet surface at 20 m.p.h., 54 feet, has been re-

tained. Several comments indicated that there are no test facilities on which the 60 m.p.h. stop on a wet surface can be safely conducted. As a measure of brake efficiency, moreover, the 20 m.p.h. stop on a wet surface satisfactorily indicates the vehicle's behavior at higher speeds, and the standard therefore specifies only the 20 m.p.h. stopping distance test.

The requirement that the vehicle stay within a 12-foot-wide lane has been adopted as proposed. The proposed requirement that no wheel lock except momentarily has been modified to permit lockup to occur on the leading nonsteerable axle on vehicles having more than two nonsteerable axles. A review of available information indicates that satisfactory control of the vehicle can be maintained if lockup is avoided on two nonsteerable axles. The rule also permits lockup at speeds under 10 m.p.h. Such low speed lockup is not considered hazardous and allows greater flexibility in brake system designs.

Some comments stated that the requirement for a controlled stop without lockup favored one variety of stability-controlling device—the anti-lock device—over other systems such as load proportioning devices. Several comments seemed to assume that the proposal required antilock devices. The requirement that the vehicle stop without locking its wheels reflects the Administration's judgment that a vehicle with locked wheels, whatever its equipment, is unstable and uncontrollable in an emergency situation. The Administration recognizes the likelihood that manufacturers of some types of vehicles may have to incorporate proportioning or antilock devices into their systems in order to meet the stopping distance requirement. However, the manner in which lockup is prevented is not specified in the standard, and if a proportioning

device or any other device can produce the desired result, it may be incorporated into the vehicle's braking system.

Although an antilock device is not required, if it is used on a vehicle it must conform to several requirements. A warning signal must be provided to warn of total system failure, a failed device must not interfere with the operation of the service brake, and electrical elements in the system must be powered through the vehicle's stop lamp circuit. Of these requirements, the first was the subject of comments that indicated some uncertainty as to the nature of a total system failure. The reason for the requirement is that a driver ought to be warned in the event that a system on which he has come to rely has stopped working altogether. Monitoring of each device separately would be difficult and costly, while monitoring of the shared elements of the system, such as the electrical circuitry, would be relatively simple. Although electrical problems would be the most likely cause of total failure, other components may also produce such failure and the language of the requirement has not been limited to a specific type of failure. A requirement that electrical power for antiskid devices on trailers must be provided through the stop lamp circuit has been added to insure the functioning of antilock systems in vehicle combinations in which the towed vehicle has an antilock system.

The requirements for actuation and release times, for brake retardation force, and for brake power have been modified somewhat in the light of information provided by the comments. The notice proposed timing curves for brake actuation and release, but subsequent review has indicated that adhesion to a timing curve is less significant than the basic ability to apply and release the brakes quickly. The curves have therefore been omitted in favor of a single application time of 0.25 second and a single release time of 0.50 second. These values are somewhat less stringent than those proposed in the notice, and reflect the judgment that a system that can meet the stopping distance requirements without lockup has less need for the rapid times originally proposed. Vehicles intended to tow other vehicles equipped with air brakes must still meet the actuation and release times with a 50-cubic-inch

test reservoir attached to the service line outlet, but the requirements for pressurization of the test reservoir itself have been deleted.

The brake retardation force requirement was the subject of numerous comments, some to the effect that the retardation force was too high to permit safe operation of vehicle combinations in which new and old vehicles are mixed, and others to the effect that the forces were too high to be achieved with reliability by available friction materials. The Administration has determined that compatibility problems are substantially lessened if the vehicle has the ability to stop without lockup and that the retention of a relatively high retardation force requirement will not lead to significant compatibility problems. It has been determined, however, that the stopping distance requirements can be met by brakes having a somewhat lower retardation force capacity than proposed, and a lower force requirement is therefore adopted.

Comments regarding the proposed brake power requirements stated that the fade characteristics required of the linings might exceed the limits of existing technology and might not be compatible with the retardation force requirements. In the light of these comments and other information it has been determined that the brake power requirements should be reduced. Accordingly the standard as adopted requires 10 decelerations at a rate of 9 feet per second per second at intervals of 72 seconds with the air pressure at 90 p.s.i. or less, and a final deceleration at 14 f.p.s.p.s. from 20 m.p.h. with a service line air pressure of 108 p.s.i. or less. In the light of the diminished power requirements, the recovery requirements have been retained with a minor adjustment from 45 p.s.i. to 40 p.s.i. in the minimum air pressure required.

A series of alterations have been made in the equipment requirements in response to comments and as a result of reevaluation by the Administration. First among these is the alteration of the stop lamp switch requirement to permit use of a pneumatic switch. The requirements for compressor capacity have been modified to require it to increase air pressure in the reservoirs from 85 p.s.i. to 100 p.s.i. in not more than 25 seconds, in place of the proposed requirement of 0-85 p.s.i. in 2 minutes. The mandatory require-



ment for a supply reservoir has been removed, and the overall reservoir capacity for trucks and buses has been reduced to 12 times the combined brake chamber capacity. The drain valve requirement has been simplified, the tolerance on the air pressure gauge has been broadened to  $\pm 7$  percent of the compressor cut-out pressure, and the low air pressure warning requirement has been modified to permit visible, nonaudible signals within the driver's forward field of view.

The notice proposed that each truck and bus have a split service brake system. It has been determined that the additional cost and greater complexity of a split system on vehicles equipped with air brakes are not accompanied by safety benefits great enough to justify requiring a split system. Accordingly, the requirement has been deleted. The remaining system with emergency capabilities is the parking brake system, and it has been determined that a parking brake system complying with the applicable requirements of the standard will provide a safe means of stopping the vehicle in the event of service brake failure.

Two aspects of the parking brake system were the subject of considerable comment. A number of comments stated that no maximum static retardation force should be specified, and several comments stated that the parking brakes should not apply automatically. The standard as adopted retains both the maximum retardation and the automatic application requirements. Each has a role in the safe operation of the parking brake system. If no maximum retardation force were specified, there would be considerable risk of lockup during emergency braking. The requirement as adopted, however, raises the upper limit on the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

from 0.33 to 0.40.

Comments stated that automatic application of the brakes while the vehicle is in motion could induce hazardous instability, due to wheel lockup or to the unexpected nature of the braking. It has been determined that adequate safeguards exist in the standard to avoid such problems. The required low pressure warning signal must operate at a pressure well above the automatic

application pressure so that the driver will have sufficient warning of incipient brake application. In addition, the limit on retardation force will act to prevent lockup under all but the most severe conditions. With respect to trailers, the automatic functioning of the parking brake system is further insured by the deletion of the proposed requirement for a check valve or similar device to protect the trailer's air pressure.

The parking brake controls have been considerably simplified by uniting in one control the manual on-off operation and the release-after-automatic-application function.

Many comments revealed a misunderstanding about the Administration's purpose in specifying test conditions. It should be understood that the standards are not instructions for, or descriptions of, manufacturer tests. For example, the condition that states that "(t)he wind velocity is zero," simply means that the vehicle must meet the applicable tests if (among other things) the air is still, that is, if the wind neither helps nor hinders the vehicle's performance. One way in which the manufacturer could check his vehicle's conformity with reference to the zero wind condition is to run the braking test with a resultant tailwind. With reference to another condition, such as the surface with a skid number of 75, the test could be run on a surface having a skid number lower than 75. Manufacturers are required to exercise due care to insure that their vehicles will meet the standard if tested by the Administration under the specified conditions, but they are at their own discretion in devising an appropriate testing program for that purpose.

A few changes have been made in the test conditions. The notice had proposed, in addition to the zero wind condition, that the vehicle stay in the roadway with a wind of 30 m.p.h. from any direction. On review, the 30-m.p.h. speed has been determined to be excessive and to unduly increase the problems of testing. In addition, most stability problems are controlled by preventing wheel lockup, as required by the standard, and the crosswind condition has therefore been deleted. In place of the "lightly loaded vehicle weight," a weight condition based on the vehicle's unloaded weight is used.

*Effective date.* Because of the development work and preparation for production that this

**Effective: January 1, 1973**

standard will require, it is found that an effective date later than 1 year from the date of issuance is in the public interest. Accordingly, the standard is effective January 1, 1973.

In consideration of the above, § 571.21 of Title 49 of the Code of Federal Regulations is amended by adding Motor Vehicle Safety Standard No. 121 as set forth below. This standard is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to

the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 19, 1971.

Douglas W. Toms,  
Acting Administrator, National  
Highway Traffic Safety Ad-  
ministration

**36 F.R. 3817**  
**February 27, 1971**

# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems—Trucks, Buses, and Trailers

(Dockets No. 70-16 and 70-17; Notice 3)

The purpose of this notice is to respond to petitions requesting reconsideration of Motor Vehicle Safety Standard No. 121, *Air Brake Systems*, § 571.121 of Title 49, Code of Federal Regulations. After issuance of the standard on February 19, 1971 (36 F.R. 3817, February 27, 1971), petitions for reconsideration were filed pursuant to 49 CFR 535.35 by a number of vehicle and equipment manufacturers. This notice grants some of the requests by amending the standard, and denies other requests.

1. *Service brake system.* The service brake system requirements have been reorganized for reasons of clarity and have been amended with respect to the order of testing and the number of tests to be conducted. The dynamometer tests have been separated from the road tests and placed in section S5.4. The road test section has been amended to specify the order in which the stopping tests are to be run. The section is further amended to provide that a truck or bus will be stopped six times for each combination of loading, speed and road conditions and that it will be considered to meet the requirement if one stop is made in the required distance with the required stability and freedom from wheel lock-up. This amendment has been adopted to ease the problems arising from a test driver's unfamiliarity with a vehicle's behavior. To accommodate antilock systems that permit some wheels to lock for longer periods than others, the reference to "momentary" lockup in S5.3.1 and S5.3.2 has been amended to refer to "controlled" lockup.

S5.3.2, *Stopping Capability, Trailers*, has been amended in minor respects, to make it clear that the 90 p.s.i. pressure level is system-wide and not confined to the brake control lines, and to provide that the trailer is to stop the combination of

vehicles without benefit of the towing vehicle's brakes.

The brake power requirements of S5.4.2 and the dynamometer test conditions of S6.2 are each amended to refer to the drum "or disc" to avoid the possibility that the sections would be misconstrued as requiring drum brakes. The brake recovery requirements of S5.4.3 are amended by lowering the minimum air pressure requirement to 20 p.s.i. from 40 p.s.i. This amendment is based on a reassessment of the problems associated with over-recovery that has led the NHTSA to conclude that 20 p.s.i. is a reasonable level.

The requirements concerning antilock system failure and the provision of power for antilock systems on trailers have been separated from the other service brake requirements and placed in S5.5.

2. *Service brake retardation force.* The standard as adopted in February 1971 required the brakes on each axle to produce specified retardation forces at each of several brake chamber air pressures. As indicated in the issuance of the standard, the primary goal of the retardation force requirement was to insure brake compatibility between vehicles used in combination. On review of petitions requesting exemption of vehicles that do not tow other vehicles from the retardation force requirements, the NHTSA has determined that for these vehicles the requirements are not necessary. Accordingly, S5.4.1 is amended to apply only to vehicles that are intended to tow or to be towed by another vehicle equipped with air brakes.

In response to petitions objecting to axle by axle force calculations, the retardation force requirements are further amended to provide that the retardation force for all axles shall be added



together and divided by the sum of gross axle ratings to arrive at the values shown in Table III. The effect of the amendment is to allow greater flexibility in the allocation of braking force between axles.

The overall braking force required of the vehicle's brakes, however, remains the same as before. The NHTSA has considered and rejected the requests for different retardation values and for substitution of SAE J992a for the dynamometer tests of S5.4.1. The present retardation force requirements in Table III are considered to be a reasonable accommodation between the need for compatibility with existing vehicles and the need to establish a uniform pattern of brake response over the range of operating pressures. The dynamometer procedures of S5.4.1.1, which permit measurement of brake forces on an individual vehicle, are more suited to the regulatory purpose of this standard than are the procedures of SAE J992a, which provides for road testing of vehicles in combination. The agency recognizes that the availability of dynamometers of sufficient capacity is a concern to many petitioners, but available evidence indicates that dynamometer access will not be a major long-term problem. The petitions to delete dynamometer testing are therefore denied.

3. *Parking brake system.* The parking brake system required by S5.4 of the standard had several features that were widely objected to by the petitioners. In particular, petitioners objected to the requirement for automatic application of the parking brakes in the event of pressure loss. Although the standard specified a maximum retardation force level of 0.40 to reduce the possibility of lockup during automatic application, many petitioners stated that automatic application of the brakes would surprise the driver and adversely affect his handling of the vehicle.

The NHTSA remains convinced that automatic application of the parking brake is a satisfactory means of providing braking in the event of service brake failure. The low pressure warning signal required by S5.1.5 is considered adequate to warn a driver of impending application of the parking brake to avoid most of the effects of surprise. However, review of the peti-

tions has persuaded the agency that automatic application of the parking brake need not be mandatory. Accordingly, the standard is amended to provide for an alternative parking brake system that is manually, and not automatically, applied.

To accommodate the new alternative, the parking brake requirements have been reorganized into two main sections: S5.6, which specifies requirements for parking brakes generally, and S5.7, which sets out the emergency braking capabilities for automatic systems (S5.7.1) and manual systems (S5.7.2) on trucks and buses. A third section (S5.8) deals with the emergency braking of trailers.

The general requirements of S5.6 are derived from S5.4 of the original standard, with some additions and amendments. The braking force generated by the parking brakes is measured, at the manufacturer's option, either by a static draw bar test, which must produce a force level of 0.28, or by a holding test on a 20% grade. The tests are to be conducted in both forward and rearward directions. As provided in the original standard, the parking brakes must be applied by an energy source that is independent of the air pressure in the service brake system.

Additional changes have been made in S5.6 with respect to the requirements for the parking brake control. The standard as published in February 1971 specified the shape and color of the parking brake control, as well as its location, and provided that manual operation and release after automatic application should be accomplished by movement of a single control. After review of the petitions, it has been decided to allow greater flexibility in the design and operation of the control. Efforts are now underway within the industry to standardize controls, and it may be that a consensus will be reached upon which a more standardized control can be based. In the meantime, the standard's specifications have been reduced to requiring the control to be separate from the service brake control, operable from the normal driving position, and identifiable as to its method of operation. The shape, color, and number of controls, and the method of operation, are left to the judgment of the manufacturer.

The major difference between the emergency braking performance required of a vehicle with a manual system and the performance required of a vehicle with an automatic system is that a vehicle with a manual parking brake is required by S5.7.2.3 to meet a stopping distance test with an air pressure failure in the service brake system. Although a manufacturer may elect to use the parking brakes to provide this emergency stopping capacity, he may use other components to supplement the parking brakes or he may use a system entirely independent of the parking brakes.

A vehicle with an automatic parking brake may, at the manufacturer's option, either meet the stopping distance test of S5.7.2.3, or have a maximum static retardation force not greater than 0.40, measured in accordance with S5.6.1. Several petitioners requested deletion of the maximum retardation force levels for automatic brakes. Although the agency remains concerned about the effects on a vehicle's stability of automatic brake application, it has determined that a vehicle capable of meeting specified stopping distance requirements when the brakes are automatically applied should not be held to the maximum force level requirement.

With respect to both automatic and manual brakes, provision is made for control of the parking brakes of the towed vehicle. It was noted by some petitioners that automatic application of a towing vehicle's brakes, without simultaneous application of a towed vehicle's brakes, could lead to unstable braking and possibly to jackknifing. To lessen the risk of such instability, the automatic brake requirements are amended to require the venting of the towed vehicle's supply line so that its brakes will apply upon application of the towing vehicle's brakes.

*4. Other provisions amended.* In S4 the definition of "antilock system" has been amended to refer to "rotational wheel slip" to distinguish the phenomenon controlled by the antilock systems from other types of wheel slip. The definitions of "gross axle weight rating," "gross vehicle weight rating," and "unloaded vehicle weight" have been omitted, since they have been incorporated in the general definitions section of Part 571, 49 CFR 571.3(b).

The equipment requirements have been amended in a number of minor respects. S5.1.1 has been amended to include supply reservoir capacities. The reservoir capacity required has not been changed, but the requirement is clarified by striking the words "greater than" in S5.1.2.1 and in S5.2.1.1. The requirement for a towing vehicle protection valve (S5.1.3) has been amended by the use of the broader term "system" in place of "valve."

The pressure gauge requirement (S5.1.4) has been amended to require a gauge in each service brake system, rather than to require a gauge directly on the service reservoir. The warning signal requirement (S5.1.6) is amended in response to petitions to provide that warning must be by means other than the pressure gauge indicator. The antilock warning signal requirement (S5.1.6), has been amended to limit the warning to the event of electrical failure, pending investigation of other types of failure for which a warning may be practicable.

*5. Petitions denied.* Several requests for amendment of the equipment requirements have been denied. A request that the service reservoirs be connected in series has been rejected as unnecessary and design restrictive. Requests for reduction in minimum reservoir capacity are also denied. The present requirement of 12 times the combined volume of service brake chambers has been applied by the SAE to intracity buses and school buses for some time and is considered a reasonable requirement for other vehicles, particularly in the light of additional demands made on air capacity by antilock systems.

Several petitions requested amendment of the vehicle weights specified in S5.3 for the service brake tests. Requests were made for additional weight on the vehicle in its unloaded condition to allow for the weight of the completed body and for safety equipment such as roll bars used during testing. Since the vehicles tested by the NHTSA will be completed vehicles, however, it is not appropriate to specify an additional weight. If an incomplete vehicle manufacturer wishes to ascertain the performance of this vehicle in one or more of its completed variations, he may do so by placing weights on the incomplete vehicle, by actually mounting a body on



it, or by any other means that are reasonably calculated to evaluate the braking performance of the completed vehicle. With respect to safety equipment, the NHTSA regards the problem of weight associated with safety devices as easily surmountable. Each of the petitions requesting changes in the weights specified in S5.3 is accordingly denied.

A number of petitions requested increases in the stopping distance required by S5.3.1. The distances specified are considered reasonable and well within the state of the art. Greater distances would increase the disparity between trucks and cars and be contrary to the interests of safety. The petitions are denied. Similarly, the petitions for an increase in the skid number of the dry surface from 75 to 80 are denied. The 75 number is representative of road surfaces, and has been a part of the consumer information requirements long enough that the availability of skid pads should not be a problem. Similarly, the requests that 30 skid number tests be run on dry pavement or that they be abandoned are denied. Braking in wet weather is an evident problem with vehicles of all types, and the NHTSA regards the wet-track test as an essential part of the standard.

The stopping capability requirement for trailers (S5.3.2) was the subject of petitions requesting deletion of the 90-p.s.i. pressure level requirement and objecting to the uncertainty involved in determining whether the tractor or the trailer is responsible if the trailer leaves the 12-foot-wide lane. The NHTSA regards a uniform service line pressure specification as an appropriate means of insuring uniformity in trailer response, even though some tractors may be designed to modulate air pressure in the lines. Since only the trailer is to be braked, the cause of deviation from the lane will be the trailer's brakes, not the tractor's. The petitions are denied.

The actuation and release requirements of S5.3.3 and S5.3.4 were subject to a variety of objections. One petitioner requested deletion of both requirements, while others requested elimination of the 50-cubic-inch test reservoir for trailers that tow other trailers. On review, the NHTSA has decided to deny the petitions. Although the stopping distance test of S5.3.1

necessarily limits the actuation time that a manufacturer can allow, the additional constraint placed on timing by S5.3.3 has the important effect of producing full braking at a very early point during the braking maneuver where the speed is greatest and the effects of a reduction in speed most significant from the standpoint of the forces involved in a crash. The brake release time has an important bearing on the maneuverability and directional stability of vehicles in emergency situations. It can sometimes be as important for the brakes to come off quickly and evenly as for them to be applied quickly.

The 50-cubic-inch test reservoir has been employed for some time in the SAE brake testing. It has therefore been retained. Other suggestions in the petitions for service reservoir timing and for additional test component specifications are not adopted at this time but may be appropriate subjects for future amendment.

With respect to the loading conditions specified in S6.1.1, a number of petitioners stated that the front-rear brake balance needed to achieve conforming performance on a truck-tractor loaded to GVWR in its bob-tail configuration would not be the best balance for that tractor when towing a trailer. This appears to be a valid objection, but the most obvious alternative—testing with a trailer in tow—involves complexities that have not been fully discussed in the petitions. A notice is therefore being prepared to propose that a truck tractor be tested with a trailer during the stopping distance tests.

*Effective date:* September 1, 1974. Review of the numerous petitions for extension of the effective date from January 1, 1973, has led to the conclusion that an effective date of September 1, 1974, would permit a longer period of fleet testing to evaluate the durability of the new systems and that the resulting production systems are likely to be substantially improved by the additional time allowed. An effective date later than one year from the date of issuance is therefore found, for good cause shown, to be in the public interest.

In consideration of the above, Motor Vehicle Safety Standard No. 121, Air Brake Systems, in § 571.21 of Title 49, Code of Federal Regulations, is amended to read as set forth below. This amendment is issued under the authority of sec-



tions 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

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Issued on February 16, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 3905**

**February 24, 1972**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems—Trucks, Buses and Trailers

(Docket No. 70-17; Notice No. 4)

The purpose of this notice is to respond to petitions filed pursuant to 49 CFR § 553.35, seeking reconsideration of the amendments to Motor Vehicle Safety Standard No. 121, Air Brake Systems, published February 24, 1972 (37 F.R. 3905). The petitions are granted in part and denied in part.

#### I. *Amendments*

S5.1.6 International Harvester stated that the operation of the antilock warning system should be the same as that of the low pressure warning signal under S5.1.5. S5.1.6 presently requires an audible warning of at least 10 seconds duration regardless of whether the visible signal required by the section is within the driver's forward field of view. The change requested by International Harvester would require an audible warning only if the visual warning is out of the driver's forward field of view. On reconsideration, the NHTSA has concluded that the system requested by International Harvester will give the driver adequate warning of antilock system failure. S5.1.6 is therefore being amended to parallel S5.1.5.

S5.1.5 and S5.1.6 In a letter designated as a request for clarification or interpretation, General Motors suggested that because diesel systems do not have an "on" position, they might be considered exempt from the requirement that the antilock warning signal must operate when the ignition is in the "on" position. Although the NHTSA does not consider it likely that the requirement will be understood as exempting diesels, the agency has concluded that amending the standard to refer to the "run" position as suggested by GM would avoid any possibility of misinterpretation. S5.1.5 and S5.1.6 are amended accordingly.

S5.2.1.1 Midland-Ross requested that a pressure should be specified at which the protected reservoir should be capable of releasing the parking brakes. On reconsideration, it seems appropriate to specify a pressure that corresponds to the lower end of the range of pressures maintained by current compressors. The section is therefore amended to specify a pressure of 90 p.s.i. The related question of when the brake is considered to be released, also raised by Midland-Ross, does not require amendment. The NHTSA considers a brake to be released at the point where it no longer exerts any torque.

S5.2.1.2 In response to a question in the Midland-Ross petition and a related request for interpretation by Wagner Electric Corporation, this section is amended by adding the word "service" before "reservoir", so that the section, as amended, requires the total service reservoir volume to be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms. The amendment reflects the basic intent of S5.2.1.2, which is to have a specified volume of air available to the service brakes.

S5.4 Several petitioners stated that S5.4 appeared to exempt some vehicles from the dynamometer requirements. This impression is erroneous, in that all vehicles are required to conform to S5.4. The source of the confusion appears to be the sentence in S5.4 which states that "[a] brake assembly that has undergone a road test pursuant to S5.3 need not conform to the requirements of this section". The intent of the standard is to conduct the dynamometer tests on new brake assemblies, and the quoted sentence was intended to make it clear that a single brake assembly would not have to pass the road test



and the dynamometer test in succession. The sentence is being amended to clarify its meaning.

S5.7.1.4 This section is amended in response to a request by Wagner Electric, to require manual application whenever the system pressure prevents automatic application.

## II. Provisions not amended

With respect to the remaining petitions, no changes are being made in the standard. In some cases this is because the petitioner has misinterpreted the applicable provisions to his disadvantage and needs no amendment to obtain the relief he wants. In other cases, the agency has concluded that the requested amendments do not serve the need for motor vehicle safety. In one or two cases, the change requested may prove desirable but cannot be fully evaluated without further information. The following discussion deals with the petitioned requirements in numerical order.

S3. Clark Equipment Company requested the addition of trailer converter dollies to the list of affected vehicles. The addition is not necessary, in that a converter dolly is a "trailer" within the meaning of that term in 49 CFR 571.3(b).

S5.1 Clark Equipment Company requested an amendment to exclude vacuum brake systems from the equipment requirements of S5.1. Despite the reference to a vacuum assist in S4, the standard does not apply to vacuum brakes and therefore does not require vacuum systems to have the equipment described in S5.1.

S5.1.2.2 It was suggested by Midland-Ross that the requirement that the reservoir must be capable of "withstanding" the specified pressure was not sufficiently precise. It may be that experience will show a need for quantification of this requirement, but the agency does not consider it to be necessary at this time. A reservoir will be considered to withstand the test pressure if it shows no pressure loss during the test interval.

S5.1.3 It was suggested by Midland-Ross that the requirements for the towing vehicle protection system should be amended to indicate the degree of protection required and the operating modes protected. The agency's response is much the same as its response on S5.1.2.2: the suggestion may prove to have merit, if systems appear

which cause problems in service. At this point, however, the agency will retain the broad requirement that a towing vehicle must have a system to protect it from the loss of air pressure in the towed vehicle, without regard to the system's design or method of operation.

S5.1.5 Midland-Ross requested an increased pressure level at which the low pressure warning signal actuates, so that it would be above the protection valve trip pressure used in new trailers. The requested change is not necessary, in that the standard does not now prevent the manufacturer from setting the signal actuation level at a pressure above 60 p.s.i. If Midland-Ross wishes to set its level at 80 p.s.i., it may do so.

S5.1.6 Clark Equipment Company requested that the antilock warning signal requirements be expanded to apply to the failure of a towed vehicle's antilock system. The NHTSA is receptive to further discussion of this issue. However, it has decided not to adopt the request at this time. Trailers are not required to have provision for antilock warning systems, and requiring towing vehicles to accommodate systems that are not likely to exist would be unjustified.

S5.3.1 Two petitioners requested amendments of the stopping distance requirements. The Carlisle Corporation requested a longer stopping distance, and Midland-Ross requested that the reference to "controlled lockup" be amended to specify a system that would provide for resumption of wheel rotation at some point before the speed falls to 10 m.p.h. Both requests are denied. The distances specified are considered to be appropriate and within the current state of the art. The requested change with respect to wheel lockup would permit systems in which all wheels could be completely locked for substantial periods, a situation that S5.3.1 was designed to avoid.

S5.3.3 Midland-Ross requested that Figure 1, referenced by this section, should be amended by specifying a pressure of 100 p.s.i. in both reservoirs, by omitting the tractor protection valve from the test rig, and by employing a service brake control valve rather than a brake pedal. Because S5.3.3 specifies a pressure of 100 p.s.i., it should be clear that each reservoir would be at that pressure, and no amendment is necessary.

A protection valve is used because such valves are in widespread use, even though they are not required by the standard. The service brake pedal specified in Figure 1 is a service brake foot control valve. No change of label appears necessary.

S5.4.1 International Harvester requested the deletion of this section as unnecessary. As stated before, the purpose of the section is to promote compatibility between the brakes of vehicles used in combination. The agency is of the opinion that it serves the stated function and has therefore retained it.

S5.4.2 Wagner Electric and the Carlisle Corporation each objected to certain aspects of this section. Wagner Electric requested the reinstatement of the phrase "at least" before the deceleration of 9 f.p.s.p.s., and requested the use of the phrase "a minimum" in S5.4.2.1, on the grounds that it is impossible to achieve a deceleration rate of exactly 9 f.p.s.p.s. In response, it should be pointed out that it is not necessary for a manufacturer to conduct his tests at exactly the specified rate, but only to test in such a manner as to assure himself that if the brakes were to be tested at that rate they would meet the requirements. It is to his advantage to test under less favorable conditions than those specified in the standard. The insertion of the language requested by Wagner would, if anything, make the test more severe for the manufacturers, in that the government could run tests with average decelerations in excess of 9 f.p.s.p.s. making the "worst case" situation much more difficult to ascertain.

The Carlisle Corporation objected to procedural disparities between the retardation force tests of S5.4.1 and the brake power tests of S5.4.2. The basic procedural difference between the sections is that the measurement period under S5.4.1 begins when the specified air pressure is reached whereas the period under S5.4.2 begins with the onset of deceleration. Although it may be that different instrumentation will be required in the two tests, they are not for that reason inconsistent or incompatible. The NHTSA considers each procedure to be appropriate for the aspect of performance that it measures.

S5.4.3 The Carlisle Corporation requested a further reduction in the lower limit of the re-

covery force, from the current level of 20 p.s.i. to 10 p.s.i. The NHTSA considers a brake system that produces a deceleration of 12 f.p.s.p.s. with a pressure of only 10 p.s.i. to be too sensitive and therefore denies the petition.

S5.5.2 Clark Equipment Company objected to the use of the stop lamp circuit to power the antilock system. The basis for the requirement is the need for compatibility between trucks and trailers made by different manufacturers. The stop lamp circuit is the most suitable electrical connection between trucks and trailers because it is always energized when the brakes are applied. It was therefore chosen as the source of power. The agency is of the opinion that the stop lamp circuit has adequate power for single trailer applications. For multiple trailers, it may be necessary to employ complementary systems as permitted by S5.5.2. The petition is therefore denied.

S5.6.1 In response to a request for interpretation by International Harvester, the intent of this section is to require parking brakes on each axle other than steerable front axles.

S5.6.2 Midland-Ross suggested the amendment of this section to specify that a sliding bogie on a semitrailer shall be placed in its most favorable position. As presently worded, the section is silent with respect to bogies so that the NHTSA will be obliged to test in a manner that favors the manufacturer. However, if there are indications that the position of the bogie makes a substantial difference in the braking performance of the vehicle, the agency will consider rule-making to specify that the trailer must meet the requirements with the bogie in any position.

S5.7.1.1 Wagner Electric requested an amendment to provide for brake application when the pressure in "any" service reservoir is less than the automatic application pressure level. The section now requires application when "all" service reservoirs are below that level. The NHTSA does not consider the requested amendment necessary to permit the type of system that Wagner envisions. It is permissible under the present wording for a manufacturer to have a system that applies the brakes upon a low pressure signal from a single reservoir. To require operation in such a case, as Wagner requests, would elimi-



nate systems that are capable of fully applying the service brakes despite low pressure in one reservoir.

S5.7.2.2 The Clark Equipment Company requested deletion of "brake fluid housing" from the list of items whose failure must not affect the parking brake system. The purpose of the section is to make it clear that the sharing of components by the service and emergency braking systems should not be construed as permitting malfunction of the parking brake system despite the provisions of S5.6.3. The petition is denied.

S5.8 The Clark Equipment Company requested the deletion of the phrase "or S5.6.2" from this section, on the grounds that it converts the requirement into a parking brake requirement that may be weaker than the emergency braking performance currently required under the regulations of the Bureau of Motor Carrier Safety. However, despite the use of .20 rather than the value of .28 specified in S5.6.1, the trailer under S5.6.2 is loaded to its GVWR and the supporting dolly is unbraked so that the braking performance required by the two sections is nearly identical. The NHTSA has therefore decided to retain the option of S5.6.2 under S5.8.

S6.1.1 Midland-Ross requested that the loading of a trailer be based on the sum of its GAWR's rather than on its GVWR. A GVWR designation for trailers is required by Part 567, and the agency considers it appropriate to specify GVWR as the test condition under this section.

S6.1.7 International Harvester again questioned the appropriateness of using a skid number of 75 for road tests. This issue has been raised

a number of times in the course of the various braking standard rulemakings. Although the NHTSA is not prepared at this time to state that a number higher than 75 ought to be selected, the agency intends to collect additional data concerning road surfaces with a view to possible future changes.

S6.1.9 Midland-Ross stated that parking brake tests for semitrailers should be conducted with the trailer front end supported by the trailer landing gear. The use of the parking brakes as part of the emergency braking system and the unknown effect of the friction in the landing gear system weigh against the adoption of this requirement. The petition is denied.

S6.2.1 The Carlisle Corporation requested that a 5% tolerance be specified in the dynamometer loading. The request is denied, for the reasons given in the preceding discussion of Wagner Electric's petition on S5.4.2.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 121, 49 CFR § 571.121 is amended . . . .

*Effective date:* September 1, 1974.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on June 21, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 12495**  
**June 24, 1972**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 73-13; Notice 3)

This notice amends Motor Vehicle Safety Standard No. 121, *Air brake systems*, by modifying the emergency stopping distance requirements for truck-tractors, the parking brake requirements for trailer converter dollies, and the recovery requirements for antilock equipped brakes, and by establishing a new test condition for loaded truck-tractors, special test conditions for certain drive and axle configurations, and a new burnish condition for road tests.

The amendments adopted by this notice represent a partial adoption of the changes proposed in Docket No. 73-13, Notice 1 (38 F.R. 14963; June 7, 1973). The comments to the proposal were divided as to the merits of most of the changes proposed. Running throughout the comments, however, was an overriding concern with lead time. Although a manufacturer might favor a change, such as the proposed change in the burnish condition, he may find himself unable to adjust to it within the time remaining before the standard becomes effective on September 1, 1974. The NHTSA, for its part, does not consider the proposed changes significant enough to warrant postponing the effective date of the standard. The agency has therefore adopted two provisions for which lead time appears to be a problem—the new burnish condition and the new truck-tractor test condition—as options for the period between September 1, 1974, and September 1, 1976. Of the remaining changes proposed in Docket 73-13, some are adopted effective September 1, 1974, others are not being adopted and will not be further considered for adoption, and others remain as candidates for adoption. If the latter are adopted, they will become effective at some date beyond September 1, 1974. The treatment accorded each of the proposed changes is set out in order below.

**S4.** Definitions were proposed for “isolated reservoir” and “service reservoir”. Insofar as the principal use of these definitions was to be in proposed amendments which are not being adopted at this time, there is little purpose in adding them to S4 at this time. They are therefore not adopted.

**S5.1.2.5** This new section was to have been added to prevent the diversion of air from the service reservoirs into other reservoirs when the service reservoir pressure is below 60 psi. In addition to questions of lead time, several comments stated that the equipment served by auxiliary reservoirs, such as windshield wipers, often plays a role in safety as significant as that of the brake system. In consideration of these factors, the section is not being adopted at this time, and if subsequently adopted will take into account both lead time and the effects on other safety systems.

**S5.1.3** The amendment proposed to the towing vehicle protection system requirements was to have accompanied the amended emergency braking requirements of S5.7, and would have designated the protection system as the system enabling the vehicle to meet the emergency stopping requirements of S5.7.2.2 and S5.7.2.3. The agency has decided to defer action on the amendments to S5.7, as discussed below, and accordingly takes no final action on S5.1.3 at this time.

**S5.1.6** An amendment was proposed to the antilock failure signal requirements in response to a petition by Berg Manufacturing Company. Berg has subsequently withdrawn its petition, and in the absence of compelling reasons to adopt the proposed change, the NHTSA has decided not to amend S5.1.6.

**S5.2.1.1** The requirement for the reservoir used to release the parking brakes was to be amended to specify two brake releases, rather than one, and to specify the initial pressure from which these releases were to be accomplished. The agency continues to regard these changes favorably, but has decided to defer final action until the issuance of amendments concerning the parking and emergency systems, as discussed under sections S5.6 and S5.7.

**S5.3.1** and **S5.3.2.** Rather than amend the general language of these sections concerning the circumstances under which lockup is permitted during a stop, the agency has decided to leave the sections essentially unaltered. In response to requests to clarify the treatment accorded liftable axles, the section is amended to permit, in effect, liftable axles without antilock on vehicles with more than two nonsteerable axles. Liftable axles on vehicles with two nonsteerable axles would continue to be subject to the no-lockup requirement except for controlled lockup allowed by an antilock system.

The principal change proposed for S5.3.1 and S5.3.2 had been a change in the description of permissible lockup from "controlled lockup allowed by an antilock system" to "lockup of wheels controlled by an antilock system that does not permit more than half the wheels on any controlled axle to lock more than momentarily." The intent of the proposed revision was to forestall systems whose "control" over the lockup of wheels, although nominally within the meaning of the language, might be so marginal as to permit more than half the wheels on a tandem axle to lock throughout the duration of a stop. The proposed amendment, however, was read by some manufacturers as expressly permitting systems in which half the wheels on each axle would not be sensed or monitored by the antilock controller or cycled by the antilock system. Such was not the intent of the proposal. It appears, on further review, that such systems are not currently in prospect. The agency has concluded that the better course is not to amend the "controlled lockup" language at this time, but to observe developments in the industry, with a view toward amending the requirements if subsequent events indicate a safety need.

**S5.3.4** The notice had proposed increasing the release time for trailers from 0.50 second to 0.60 second. In the face of several objections to the proposal on the grounds that it ran counter to the need for coordination of braking between vehicles in combination, and on the basis of information indicating that the timing problem is solvable for trailers, the proposal is being withdrawn.

**S5.4.1** The notice had proposed deleting the retardation force requirement, leaving it applicable only to towed vehicles. The change had been proposed as a result of the proposed amendment to the tractor test conditions whereby the tractor would be tested with a trailer. In the light of the comments, and of the continuance of the current tractor test conditions as an option, the NHTSA has decided not to adopt the proposed change.

**S5.4.3** The notice proposed to delete the minimum recovery pressure requirement for brakes equipped with antilock systems, leaving the 20 psi minimum force level for other brakes. Upon further consideration, the agency has concluded that a minimum recovery force requirement should be retained for antilock equipped brakes, but at a level below 20 psi. The agency has determined that 12 psi is a minimum level that permits a greater variety of brake linings while retaining a residual protection against oversensitive brakes in the event of antilock failure. Accordingly, the agency adopts 12 psi as the minimum recovery force for antilocked brakes.

**S5.6** The parking brake requirements of S5.6 had been one of the principal areas affected by the proposal. In addition to changes in the parking brake application requirements and deletion of the optional static pull test for parking brake holding ability, the notice had proposed new requirements for parking brake stopping capability. This latter proposal received almost unanimous criticism. Although the agency has not concluded that the proposal is without merit, the issues raised by the comments and the evident lead time problems associated with the proposal have led the agency to conclude that no further action should be taken without additional notice and opportunity for comment and that the effective date for any such requirement should lie beyond September 1, 1974.



Of the remaining changes to S5.6 proposed by the notice, only the exemption of converter dollies from the parking brake requirements is being adopted at this time. The proposed deletion of the optional static pull test of S5.6.2 has not been carried out, and the options of S5.6.1 and S5.6.2 will be retained. The proposed parking brake application requirements of S5.6.6 and S5.6.7, which had reflected amendments proposed to the emergency braking requirements of S5.7 are not being adopted at this time, pending further rulemaking on S5.7.

**S5.7** The notice had proposed substantial revisions to the emergency braking requirements of S5.7, principally in response to a petition by ATA and to an earlier petition by Ford. The majority of the changes proposed in response to the ATA petition continue to be viewed favorably by the NHTSA. However, review of the comments suggests both that further refinements are necessary and that the proposed changes will require additional time for implementation. The agency is therefore deferring final rulemaking action on the aspects of S5.7 addressed by the ATA to a later date and will issue such changes as it may decide upon with an effective date beyond September 1, 1974.

Amendments to the emergency stopping distance requirements, presently contained in S5.7.2.3 of the standard, were proposed by two successive notices. In Docket 73-4, Notice 1 (38 F.R. 6831), the agency proposed a favorable response to a petition by Ford concerning the emergency stopping distances for short-wheelbase two-axle truck-tractors in the unloaded condition. When tested in this weight condition, truck-tractors are driven without a trailer—a condition in which they are seldom operated over the road. The effect of the proposed amendment would have been to permit a limited number of truck-tractors equipped with modulated emergency braking systems to stop in a somewhat longer distance than that permitted other vehicles with modulated emergency braking.

Comments to Docket 73-4 indicated that there were other vehicles whose braking systems were complicated by the shorter emergency stopping distance. In response to these comments, the agency proposed in Docket No. 73-13, Notice 1, to apply the longer stopping distances to other

vehicles in the unloaded condition provided they were capable of stopping within the shorter distance with the assistance of the parking brakes. The comments to Docket No. 73-13 objected to the use of the parking brake in this fashion, and some asserted that if the longer distance were appropriate for some vehicles it should be appropriate for all. Upon review of the comments, the agency has decided against a general lengthening of emergency stopping distances. Upon weighing the rarity of truck-tractor operation without a trailer against the potential costs of modifying truck-tractors to meet the shorter stopping distance in that configuration, however, the agency has concluded that the longer stopping distances specified in Column 4 of Table II should be applicable to truck-tractors, regardless of weight distribution or number of axles, but that other vehicles should continue to meet the emergency stopping distances of Column 3 of Table II. Section S5.7.2.3 is amended accordingly.

**S5.8** The notice had proposed to transfer the emergency braking capability requirement for trailers from S5.8 to S5.6.7. Until such time as the agency decides to adopt S5.6.7, S5.8 will be retained. To provide emergency capability for converter dollies, in the absence of mandatory parking brakes for them, the NHTSA has amended the section to provide for application of the dolly's service brakes in the event of complete air pressure loss in the control lines. This system is presently installed in virtually all dollies, as a result of regulations issued by the Bureau of Motor Carrier Safety (49 CFR 393.43) and is considered to be a practicable substitute for the parking brakes in emergency situations.

**S6.1** A number of revisions to the test conditions of S6.1 were proposed. These revisions are adopted in substance, with some changes in structure and in section numbering. The new truck-tractor test condition, whose insertion as S6.1.2 had caused confusion as to the fate of the old S6.1.2, has been adopted as S6.1.10, thereby leaving the current sections S6.1.2 to S6.1.9 with their present numbering.

**S6.1.8** The road test burnish procedures proposed in the notice are being adopted as an optional procedure for the period September 1, 1974, to September 1, 1976. After September 1,



1976, the new burnish procedure will replace the older procedure as the only burnish prescribed for road tests. This two-step arrangement appears necessary to permit manufacturers whose testing to date has been conducted with the current burnish procedure, and who need additional time, to phase in the new procedure.

**S6.1.10** A similar phase-in has been found necessary for the new tractor test conditions. Several manufacturers had stated that their evaluation programs had been conducted without trailers and that retesting would be necessary in order to certify their vehicles under the new conditions. The new conditions are therefore adopted as an option for the period September 1, 1974, to September 1, 1976. During this period a manufacturer may choose to test his vehicles under either loading condition, and such tests as the NHTSA conducts will be in the loading condition chosen by the manufacturer for the vehicle under test.

**S6.1.10.1** The control trailer to be used under S6.1.10 is specified as conforming to Standard No. 121.

**S6.1.10.2** The center of gravity of the loaded trailer is specified as being at a height of  $66 \pm 3$  inches above the ground. There was a variety of opinion in the comments as to how high the center of gravity should be, but upon reviewing the comments the agency has concluded that the  $66 \pm 3$  inch range originally proposed is reasonably representative of loading conditions. Axle load shift due to the rake angle of the trailer bed does not appear to be a problem in that each axle of the trailer is loaded to its GAWR when the trailer is connected to the tractor.

**S6.1.10.3** and **S6.1.10.4** In response to comments suggesting that the lengths and weight ratings of the trailers specified in the proposal were not those in most general use, the agency has increased the length of the trailer specified in S6.1.10.3, reduced the length of the trailer specified in S6.1.10.4, and lowered the gross axle weight rating for each trailer.

**S6.1.10.5** The loading condition of the trailer for tests of the tractor's brakes is substantially the same as that proposed in the notice. The tractor's fifth wheel does not have to be adjustable, as some comments inferred, but if it hap-

pens to be adjustable it must be adjusted to produce the specified weight distribution. The axle loads are to be measured at the tire-ground interfaces, in response to comments that the former reference to the "force transmitted to the tractor axles through the kingpin" was not clear as to the method of measurement.

**S6.1.10.6** and **S6.1.10.7** These sections are designed to establish performance specifications for the trailers to be used for truck-tractor testing. They are not intended as performance requirements for trailers, but only as test equipment specifications for the tractor tests. The trailer loading condition specified is somewhat different from that used in testing the performance of the tractor, because the tests are aimed at isolating the performance of the trailer brakes. The location of the fifth wheel is specified as the position determined under S6.1.10.5, but the trailer is loaded so that its axle is at its gross axle weight rating and its kingpin is at unloaded weight.

The actuation and release times specified for the trailer in the evaluation tests were questioned by several comments. It may be necessary, in some cases, for a special valve to be installed on the tractor if the tractor's system is too slow to actuate the trailer's brakes in the time specified. The purpose of the timing specification is simply to remove the tractor's performance as a factor in the trailer brake evaluation. When the trailer is used in tests of a tractor pursuant to S5.3.1 it will, of course, be connected to the tractor's normal control system.

In addition to specifying the same loading in S6.1.10.7 as in S6.1.10.6, the ratio applied to determine the trailer's stopping distance under S6.1.10.7 has also been revised to conform to that used in S6.1.10.6. To accommodate tractors that are not capable of 60-mph speeds, each section now specifies that the trailer is tested at the speed at which the tractor for which it will be used is tested.

**S6.1.11** and **S6.1.12** These sections relate to special drive conditions and the position of lift-able axles, and are adopted as proposed.

**S6.1.13** This new section was proposed to establish performance requirements for the trailer timing test rig specified in Figure 1. In the

light of objections in the comments to the performance levels specified, the agency is deferring final rulemaking at this time and will issue such changes as it may decide upon with an effective date beyond September 1, 1974.

The tables and figures proposed for adoption or amendment by the notice are adopted as proposed, except for the omission of the parking brake dynamic test from Table I.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 121, *Air brake systems* (49 CFR 571.121), is amended . . . .

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Effective date: September 1, 1974.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on December 20, 1973.

James B. Gregory  
Administrator

**39 F.R. 804**  
**January 3, 1974**





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 74-10; Notice 2)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, in response to several petitions for reconsideration of amendments to the standard published January 3, 1974 (39 F.R. 804), and after consideration of comments on a proposal published March 1, 1974 (39 F.R. 7966). A notice of proposed rulemaking has been issued separately to propose modification of the standard as it applies to trailers.

#### *Reconsideration of Amendments—73-13; Notice 3*

The amendments under reconsideration concern emergency stopping distance requirements for truck tractors, parking brake requirements for trailer converter dollies, recovery requirements for antilock-equipped brakes, a new test condition for loaded truck-tractors, special test conditions for certain drive and axle configuration, and a new burnish condition for road tests. Several manufacturers commented on issues which lie beyond the scope of those amendments and are therefore inappropriate for treatment in this response. Wagner Electric and Midland-Ross' petitions to amend S5.1.2.1 and S5.2.1.2 (Midland also petitioned on S5.1.2.2 and S5.2.1.3) and Wagner's petition to modify Table III retardation values will therefore be considered as petitions for new rulemaking to be answered in a separate notice.

The American Trucking Association (ATA) requested reconsideration of NHTSA's decision to permit either automatic or modulated emergency brake systems as options while further consideration of the modulated system takes place. As stated in Notice 3, the NHTSA has concluded that some aspects of the system may need refinement and that all vehicle manufacturers cannot in any case make all their vehicles conform to modulated brake system requirements

by the standard's effective date. Accordingly, while the majority of the changes proposed in response to the ATA petition continue to be viewed favorably, for the present ATA's petition is denied.

Wagner Electric and General Motors objected to the retention of brake retardation force requirements for towing vehicles as redundant in view of the stopping distance requirements which also apply to them. The NHTSA proposed deletion of these dynamometer requirements previously and, having considered the latest submissions and information, hereby amends S5.4.1 to delete towing vehicles from the standard's requirements. The NHTSA has tentatively concluded that the stopping distance requirements can establish satisfactory brake balance between towed and towing vehicles, and that the cost of dynamometer testing is not justified by corresponding safety benefits. It should be noted that the dynamometer test may be reinstituted if experience demonstrates its need.

Fruehauf, in a late submission to this docket and in other docket comments, has emphasized the importance to lateral stability of a slower release time for trailers. A 0.60-sec maximum release time proposed in Notice 1 was not acted on in Notice 3 in the belief that it ran counter to the need for coordination of braking between vehicles in combination, but further study has persuaded this agency that a slightly slower release time for trailers is not detrimental to safe operation of combination vehicles. S5.3.4 has been amended accordingly.

General Motors and the Motor Vehicle Manufacturers Association (MVMA) petitioned for deletion of the 12 lb/in<sup>2</sup> minimum pressure requirement for brakes controlled by an antilock

system. The purpose of the minimum pressure is to eliminate oversensitive brakes because of the difficulty in modulating them. The lower value was established for antilock-controlled brakes on the assumption that a functioning antilock would normally compensate for oversensitivity. A residual value was retained in the event of antilock failure, not to compensate for driver surprise, as assumed by the MVMA, but rather to aid the driver in his efforts to carefully modulate a sensitive brake. The NHTSA has seen no evidence to support the assertions made by MVMA that this requirement could downgrade stopping performance. Except for General Motors' request to clarify antilock "control" in this section, the petitions to amend S5.4.3 are accordingly denied. S5.4.3 is modified to substitute "subject to the control of" in place of "controlled" to make clear that the antilock need not be activated.

General Motors and the MVMA objected to the test condition where a vehicle "is loaded to its gross vehicle weight rating, distributed proportionately to its gross axle weight ratings", arguing that this distribution formula could lead to overload of one or more axles. The General Motors illustration indicates a misunderstanding of the section's wording. The phrase "is loaded to its gross vehicle weight rating" describes a weight condition, that of the fully loaded vehicle, and the provision requires that this weight be distributed in proportion to the gross axle weight ratings. General Motors and the MVMA apparently interpreted the phrase to describe only that portion of the gross vehicle weight rating which "is loaded" on an unloaded truck to bring its weight up to GVWR. The condition states that what is distributed proportionately is the gross vehicle weight *rating* (i.e. the weight of the loaded vehicle), and not just that portion of the rating that constitutes the "load." There is no mathematical possibility of overloading an axle under this condition, since the GVWR must be no more than the sum of the GAWR's.

Ford stated with respect to S6.1.10.5 that "on some vehicles, it may not be possible to adjust the fifth wheel to a position in which the tractor can be loaded to GVWR without exceeding the GAWR of one axle." It may be that Ford's problem arises from the same misunderstanding

described above with respect to GM and MVMA. To the extent, however, that the Ford petition implies that a manufacturer can establish a GVWR for a truck tractor which can not be attained without axle overload, the petition is based on a misconception of GVWR and is therefore denied.

Wagner Electric requested that the loadings in S6.1.10.6 be made uniform with S6.1.10.5 and S6.1.10.7. These loadings are not intended to be uniform, however, because the first condition specifies loading for purposes of truck-tractor testing, while the latter two conditions only establish test equipment specifications for the "control trailer test device" which is used in testing the truck-tractor. S6.1.10.6 and S6.1.10.7 loadings differ so that the service brake and emergency brake capabilities of the control trailer are separately designed to place greater demands on the truck tractor's service braking system than its emergency braking system. The calculations are based on an evaluation of the capacity of the brakes that are expected to be placed on production trailers in accordance with the dynamometer test requirements.

For the benefit of manufacturers who mistakenly consider these test conditions to be minimum performance requirements, it should be emphasized that the S6.1.10.6 and S6.1.10.7 values are conditions, i.e., characteristics of the control trailer test device which must be duplicated as closely as possible for testing. As with any other test device characteristic, to the degree that the control trailer can not produce exactly the right stopping distance, the certifying manufacturer should ascertain conformity of his vehicles under slightly more adverse conditions than those specified, in this case by slightly reducing the trailer brakes' capacity (to stop in the specified distance).

General Motors objected that the lighter control trailer capacities (18,000 and 32,000 pounds in place of 20,000 and 40,000 pounds) specified in the amendment would lower control trailer performance and thereby increase the performance required of truck tractors. The change was made to specify commonly used trailers, to aid manufacturers in meeting the September 1, 1974, effective date. The NHTSA continues to consider the increased availability of test devices to



be more significant to promulgation of a fully satisfactory final rule than the small quantitative change noted by General Motors, and their petition is therefore denied.

General Motors and the MVMA requested specification of test load density to resolve difficulties in establishment of the "worst case" center of gravity height when testing trucks. Specification of a test load density, however, is unnecessary. The manufacturer of a truck or incomplete vehicle should establish the limits of placement of the load center of gravity as a part of his design considerations, to be specified in the Part 568 document for an incomplete vehicle or in his instructions to users in the case of a completed one. This establishes an envelope within which the vehicle is certified to comply with Standard 121 under full load. Once that envelope is established, the appropriate load densities to test the vehicle's conformity can be derived from it.

Several petitions were received with regard to brake burnish procedures. The MVMA and Ford requested reinclusion of language found in the proposal that specified an acceleration procedure for vehicles unable to reach the specified speed in one mile. General Motors submitted minor changes of an editorial nature and new language to specify an increased deceleration rate for vehicles unable to reach the specified speed in one mile. The NHTSA has concluded that language which appeared in the proposal and reflects current SAE procedure should be adopted. The General Motors increased deceleration method represents a new procedure which has not been evaluated by the NHTSA or proposed in any previous rulemaking. The suggestion of 50 snubs before allowing a cooling period is also a new General Motors proposal which the NHTSA has not had the opportunity to evaluate. With the exception of one recommendation, General Motors' editorial suggestions are adopted to be consistent with the titles in Table IV. The word "maximum" was deleted from S6.1.8.1 at the request of several manufacturers because it was inappropriate to the specification of temperature range.

Ford requested the addition of a burnish procedure for parking brakes which do not utilize the service brake components. Language has

been added to specify a burnish procedure for these brakes in accordance with the manufacturer's recommendations.

Two other issues were raised with regard to the road test conditions. To answer Wagner Electric's petition for clarification of S6.1.10.7, the "valve controlling the trailer brakes" may or may not be part of the normal commercial system of the tractor depending on whether or not the normal system can provide the timing specified. The purpose of standardizing timing specifications is simply to remove the tractor's performance as a factor in the test trailer brake evaluation. When the trailer is used in tests of a tractor pursuant to S5.3.1, it will, of course, be connected to the tractor's normal control system.

General Motors questioned the safety benefit of wheel lockup requirements for liftable axles on buses equipped with two non-steerable axles if other axles other than the liftable axle can themselves meet the stopping distance requirements. The agency considers the controlled performance of the liftable axle to be of considerable benefit for added stability under braking conditions other than straight ahead braking required by the standard, and on this basis it denies the GM petition.

In other areas of the standard, General Motors petitioned for longer emergency stopping distances for all vehicles, reasoning that an exception to the values for truck-tractors in an unloaded condition (based on rarity of operation) could be as easily justified for the rare emergency stop situation of any vehicle. The rationale ignores the fact that the emergency values were established in the first place with the rarity of such occurrences in mind, and that the exception is posited on the combined rarity of unladen truck-tractor operation involved in an emergency situation. The problem of testing chassis-cabs can be met by specifying conformity to S5.7.2.3 with a specified weight on the rear axle representing the vehicle body weight. General Motors' petition to apply column 4 values to all vehicle emergency stopping distance requirements is therefore denied.

Wagner Electric petitioned to modify the wording of S5.8 concerning emergency application of trailer converter dolly service brakes so



that the wording would be identical to Bureau of Motor Carrier Safety regulations (49 CFR 393.43). Wagner's proposed wording, however, applies to towing vehicle performance, where the triggering signal is a low, fixed air pressure, and the wording would not be appropriate for trailer performance, where the triggering signal is a venting of the supply line to the atmosphere. The S5.8 language is actually compatible with § 393.43(b), in that BMCS calls for towing vehicles to have an automatic means of activating the emergency features of the trailer air brakes, and S5.8 calls for compatible automatic features on the trailers. Wagner's petition is therefore denied.

General Motors asked whether the S5.4 requirement that brake assemblies meet tests in sequence actually exempts some brakes from all three tests if they are elsewhere exempted from the first. Paragraph S5.4 does not exempt any brake assemblies from any requirement. The brakes on a vehicle which does not have to comply with S5.4.1 must comply with S5.4.2 and S5.4.3.

Several comments requested correction of the omission of the words "in the service brake system" from S5.7.2.3 as published in Notice 3. The omission was inadvertent and has been corrected.

General Motors requested an indication that stopping sequence steps 2 and 3 in Table I apply only to truck-tractors. The steps have been changed to indicate that these steps apply only to truck-tractor testing by means of a control trailer. As for the objection that S6.1.10.7 implies the emergency system of a truck-tractor must control the trailer spring brakes, S6.1.10.7 has been clarified by the addition of a qualifying phrase. S6.1.10.6 and S6.1.10.7 have been further clarified by adding headings to indicate that they are test equipment specifications.

In a separate submission to Docket 73-13, Wagner Electric requested clarification of the trailer test rig timing issue, which had been reserved in Notice 3 as a candidate for adoption at some later date. Midland-Ross also raised the issue with regard to a requested modification of Figure 1. The petitions pointed out that an NHTSA test showing a failure would be inconclusive if it were compared to manufacturer

testing conducted on a faster rig, and showing conformity. The remedy is to specify "legal baseline" actuation and release times, so the manufacturer will know the precise conditions under which his equipment must meet the requirements, and both government and industry testing can be conducted so as to produce conclusive results. The NHTSA therefore establishes the actuation and release values proposed in Notice 1 with minor modification. They will not become effective until September 1, 1975, to maintain the validity of testing already conducted. The values are set at two-significant-figure accuracy in agreement with Wagner that the values should match the actual trailer performance values. Because the actuation time is lowered to 0.06 seconds, the NHTSA may find it necessary to improve its test rig's speed by removing the tractor protection valve. Therefore, the valve has been made optional. The performance of the test device had been modified from the original proposal so that initiating signal points are the same as for the actual performance tests, and so that initial release pressure agrees with the 95-psi requirement of the performance tests.

Other issues raised by Wagner and Midland-Ross in petitions to Notice 3 will be answered in a later notice.

#### *March 1, 1974 Proposals*

The NHTSA proposed modification of the standard's effective date, brake actuation times, and road and dynamometer tests as they apply to the service brake system and emergency stopping performance of all vehicles subject to the standard except trailers (39 F.R. 7966, March 1, 1974). The proposals would have affected vehicle types separately to reflect the particular problems faced by fire fighting vehicles, "special permit" vehicles, on/off-highway vehicles, and standard highway trucks and buses. Manufacturer concern centered on the availability of components to meet the standard by September 1, 1974, and the reliability of the antilock systems which will be utilized by most manufacturers to meet the requirements. Having carefully considered the comments submitted in response to this proposal, the NHTSA hereby delays the standard's effective date for trucks and buses to

March 1, 1975, and establishes interim requirements for particular categories of vehicles essentially as they were proposed.

The limited delay of effective date does not satisfy the requests of Ford and General Motors, who argued for a complete delay of the standard for one year, followed by limited implementation of the standard. Other comments, including those of Chrysler and Rockwell International, asked for significant delays of one year or more based primarily on component shortages which will be discussed separately with regard to the specific problems of separate vehicle types.

Ford argued that the stopping distance requirements mandated high-torque front brakes that could degrade suspension and steering characteristics of some vehicles to an unsafe level. Their submission to the docket and materials submitted in conjunction with a presentation to the NHTSA on March 28, 1974, included evidence of erratic handling and suspension distortion in high- and low-speed spike stops on the proving ground by short wheelbase trucks. The American Trucking Association joined Ford in questioning vehicle handling under the standard's requirements.

Review of the Ford submission indicates that unmanageable suspension problems of this nature are generally encountered in short-wheelbase trucks with suspensions that have not been adequately modified for Standard 121 brakes. Other manufacturers have indicated in some cases that their solution to such severe instability has been a major redesign of the front axle and suspension system, or a decision to withdraw vehicles with especially short wheelbases from their product line. The NHTSA concludes that sufficient lead-time has been made available to all manufacturers to correct the steering and suspension problems of reasonably-designed short-wheelbase vehicles, and that vehicles with wheelbases that are so short, and centers of gravity that are so high, that they cannot stop safely in the stopping distances specified should not be on the highway.

General Motors and other truck manufacturers argued for delay of the standard's effective date for one year to permit additional field testing of the reliability of current antilock devices. The likely effect of such a delay, however, would be

further delay in the availability of production antilock components. One air brake equipment supplier believes "continued development will eventually improve their (antilock systems) overall performance but most of these changes for refinement in electronics, improved pneumatic/electronic response, durability, sensor standardization and design standards require the normal evolution of field experience under real life conditions, using mass produced parts for a genuine field history."

The reliability of antilock systems can presently be judged on the basis of the performance of systems that are already in fleet test programs (and to a lesser extent by evaluation of antilock systems used for many years in passenger cars). One truck manufacturer has reported average miles between failures on fleet testing to be 89,000 miles (176,000 miles in operations within the continental United States). A manufacturer of antilock equipment reported in February 1974 that over 8,000 of its air brake skid control systems are in field use, with excellent reliability experienced. Neither this manufacturer nor any other has reported any highway accident which was attributed to a malfunction of the antilock system.

General Motors included in its list of antilock failures incorrect test procedures, missing fuses, and warning light malfunctions. While these are not insignificant concerns, they are an indication that unfamiliarity with the new system accounts for some of the malfunctions experienced in test programs. In addition, other malfunctions reported by General Motors are believed to be the result of systems being "added on" instead of being designed into the vehicles.

General Motors and Ford reported accidents in their proving ground tests, which they believe illustrate what might happen if an antilock system malfunctions in service. The NHTSA has studied the accident information which was submitted and has concluded that these accidents occurred as a result of rear wheel lockup during panic-type, full brake application and would also have occurred if the vehicles were not equipped with antilock systems. The NHTSA concludes that the reliability of antilock systems is such that their introduction will contribute to motor vehicle safety.



Both the Ford and General Motors recommendations, as well as the other petitions which requested delays substantially greater than those proposed by the NHTSA, are excessively broad in that they would postpone all the safety benefits of the standard, because of specific problems in limited areas. The NHTSA proposal, by comparison, proposes only those modifications which are essential to implement the standard as rapidly and fully as possible.

Because there was only a short interval between the latest proposal and the effective date of the standard in which to implement any modification of the standard, the proposal included a blanket 4-month delay of the standard's effective date for all affected vehicles. International Harvester, the largest manufacturer of air-braked vehicles that commented on the proposal, indicated agreement with the 4-month delay and stated their intention to build vehicles which comply with the standard after that date. General Motors noted the possibility that axles and the larger foundation brakes necessary to meet the standard would be available. The major supplier of axles to the truck and bus industry has estimated that, with no margin for error, some axles could be ready for January 1, 1975. The NHTSA has evaluated the current industrial shortage and leadtime problems precipitated by factors beyond manufacturer control and has concluded that a March 1, 1975, effective date as it applies to powered vehicles is necessary to allow the orderly implementation of Standard No. 121. The NHTSA cannot agree with Blue Bird Body Company that smaller manufacturers should automatically be granted a year to meet the standard following the availability of production components for Standard No. 121.

The NHTSA has also determined that the proposed requirement that the test reservoir pressure reach 60 psi in 0.25 sec cannot be implemented prior to this effective date, and the proposal is therefore withdrawn. The modification of systems to achieve this requirement could negate the compliance test data which has been accumulated by many manufacturers.

Most comments which requested a longer delay of the effective date or more specific relief were addressed to the problems of specific vehicle types. There were no specific comments, how-

ever, on the proposed 1-year delay in the applicability of the standard to fire fighting vehicles. Accordingly, the standard is amended to apply to fire fighting vehicles only after September 1, 1975.

The comments on "special permit" vehicles (defined in the proposal having a 108-inch overall width or a 24,000-pound gross axle weight rating (GAWR), centered on the inadequacy of the definition when applied to "heavy hauler" trailers. Trailers are dealt with in a separate notice of proposed rulemaking published in today's *Federal Register*. The few comments addressed to "special permit" trucks favored the September 1, 1976, effective date, but suggested more time might be necessary to acquire the necessary components because of their low priority in suppliers' engineering programs. At this time the NHTSA amends the standard to grant these vehicles a September 1, 1976, effective date. Any supply problems beyond that will be considered at a later time as they arise.

*On/Off-Highway Vehicles:* Comments on the proposal to substitute dynamometer requirements for stopping distance requirements until September 1, 1975, for trucks that have a front steerable axle with a GAWR of 16,000 pounds or more, or a front steerable drive axle, fell into two groups. Comments either argued that the delay was insufficient, particularly with regard to front steerable drive axles, or they objected to particular aspects of the relaxed interim requirements.

The NHTSA has decided to maintain the September 1, 1975, date for the full stopping distance requirements. An evaluation of all available information in this area indicate that air brake components will be available to meet the required level of performance for vehicles in this category.

Manufacturers raised objections to the proposed interim requirements as they were expressed in S5.3.1.2 and S5.7.2.3.1. Wagner Electric, General Motors, White, and Diamond Reo requested clarification that the S5.3.1.2 requirement would apply to "straight" trucks as well as towing vehicles. The language of S5.3.1.2 makes clear that any trucks in the described category need not meet certain stopping distance



requirements if their brakes conform to the formula in S5.4.1.

Wagner, Mack, and Abex questioned the proposed requirement that the dynamometer values be applied to each axle system separately, instead of being summed for the entire vehicle braking system. The axle-by-axle dynamometer approach was specifically included in the proposal to ensure that brakes would be provided on the front axle and not to minimize braking on the rear axle. Therefore this section is modified to require a certain level of performance for the front axle and a sum total of performance overall. If a specific value were not required for the front axle, manufacturers would be tempted to make minor modifications of present front axle systems and thereby avoid the opportunity to gain experience with the newer, stronger foundation brakes and axles.

The language "the brakes on each wheel" in S5.3.1.2 confused Abex with regard to the dynamometer test requirements. To clarify the requirement while in no way changing it, the wording is amended to "its brakes."

In answer to Wagner's request for a definition of "axle system", the term is used in the same sense as it is used in the definition of GAWR found at 49 CFR § 571.3. "Axle system" is used instead of "axle" to avoid confusion in situations where a suspension system does not employ an axle. The term has not created difficulty in the GAWR definition.

The S5.7.3.2.1 requirement for dynamometer testing in place of emergency stopping performance testing parallels the S5.3.1.2 requirement. General Motors has pointed out, however, that dynamometer testing of spring brakes often found in emergency brake systems is impracticable. Wagner also points out that the requirement can be viewed as redundant in view of S5.3.1.2. In view of these objections, the NHTSA concludes that retention of the emergency stopping requirement (except for the stopping distance) would be preferable to a dynamometer requirement. For the interim period, therefore, the vehicle will be required to come to a stop within the 12 foot lane using its emergency braking system.

*Highway Trucks and Buses:* For powered vehicles that do not fall in the categories treated above, the proposal would have lengthened stopping distance requirements 5 percent to compensate for the variations expected in early production components that affect stopping performance. Most manufacturers argued that the 5 percent longer distances would be required for the indefinite future, because production variations would continue to affect performance significantly. The NHTSA established the stopping distances on the basis of the ability of available equipment, and expects that experience in the production of these components will lead to predictable quality and the assurance that a vehicle will in fact perform as well as it is designed to.

White Motor Company suggested a clarification of S5.3.1.3 and S5.7.2.3.2 to make clear that the test procedures for the proposed Table V stops are identical to those in S5.3.1 for the Table III stops. The change has been made without in any way changing the requirements.

*Other Issues:* Two proposals which affected most trucks and buses were the brake actuation time of 0.35 sec and the option of a manual pressure reduction valve to limit air pressure to the front axle. Nearly all manufacturers supported the 0.35-sec actuation time for trucks and buses and requested that it also be extended to trailers. The NHTSA amends the standard as proposed for truck and bus brake actuation. Trailer brake actuation requirements will not be changed, however, in light of the imminence of the effective date and the consequent need for stability in the standard.

The manual pressure reduction valve proposal was not supported as expected. Even Ford and General Motors, who questioned the safety of high-torque front brakes, did not agree that the valve would have a positive safety benefit. In view of the sharp disagreement in the comments over the usefulness of the valve in the hands of different drivers, the proposal is withdrawn.

In the course of their comments on the proposal, several manufacturers and suppliers indicated uneasiness about the policy of the NHTSA with regard to isolated failures of components that have been certified as complying with Standard No. 121. Some comments expressed a belief

Effective: September 1, 1974  
March 1, 1975

that the NHTSA was adopting or announcing a new policy regarding compliance, with reference to a panel discussion at the February 25, 1974, meeting of the SAE in Detroit. The remarks in question, by an NHTSA Assistant Chief Counsel, were to the effect that the agency expects that each manufacturer will design his vehicles and his test program so as to constitute due care that each of his vehicles complies with the standard. That is not a new policy, however, but merely a statement of the requirements of the National Traffic and Motor Vehicle Safety Act, which has been followed continuously by this agency. The NHTSA has avoided a rigid position that each failure necessarily constitutes a violation of the Act, just as it has the position that some percentage of failures is automatically "allowable." What constitutes due care in a particular case depends on all relevant facts, including such things as the time to elapse before a new effective date, the availability of test equipment, the limitations of current technology,

and above all the diligence evidenced by the manufacturer.

All interested persons should note that, although a proposal was necessary with regard to changes for trailer manufacture, the NHTSA does not intend to make any other amendments of Standard 121 before its effective date.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

*Effective Date:* September 1, 1974, for trailers; March 1, 1975, for trucks and buses.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on May 14, 1974.

James B. Gregory  
Administrator

**39 F.R. 17550**  
**May 17, 1974**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 74-10; Notice 4)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, to delay the effective date of the standard as it applies to air brake-equipped trailers until January 1, 1975.

The January 1, 1975, effective date was proposed in a notice published May 17, 1974 (39 F.R. 17563) which invited comments on the proposal until June 17, 1974. On the basis of urgent requests by manufacturers and the Truck Trailer Manufacturers Association, a new comment closing date of June 4, 1974, was established for the effective date issue (39 F.R. 18664, May 29, 1974). The separate issue of a new "heavy hauler trailer" category is still subject to the June 17 date for comments, and further action will be decided on after that date.

Only three commenters, out of the fifty who responded, opposed the 4-month postponement. These three were suppliers to the trailer industry who claimed that they were ready to provide the needed components by September 1, 1974,

and stated that a delay in the effective day would entail additional costs to them. The NHTSA finds, however, that the September 1, 1974, date does not provide sufficient time for an orderly transition to production of the trailers with the new components, and that a delay until January 1, 1975, is therefore in the interest of motor vehicle safety.

In consideration of the foregoing, the effective date of Standard No. 121 (49 CFR 571.121) is changed from September 1, 1974, to January 1, 1975, as it applies to trailers.

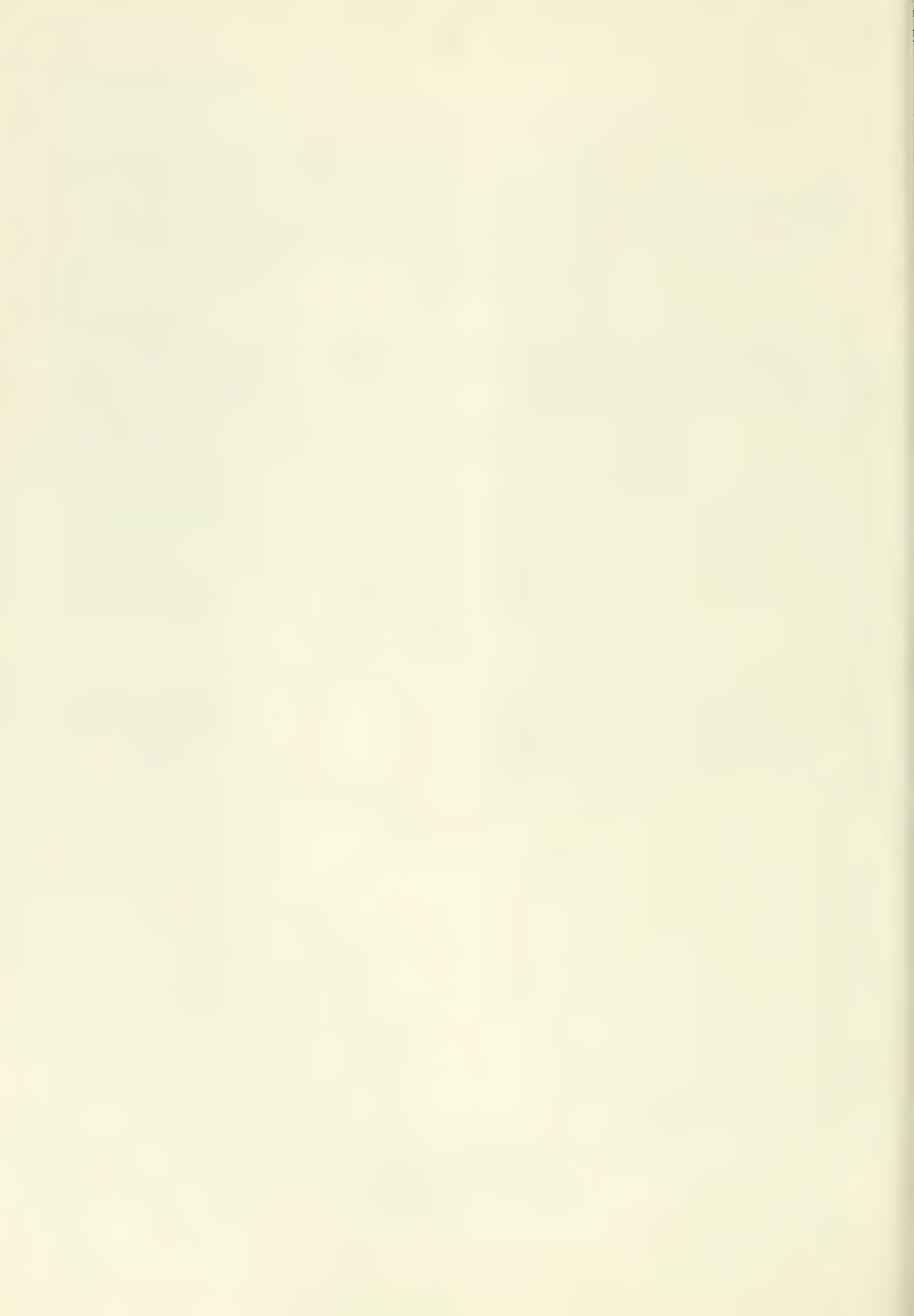
(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on June 6, 1974.

Robert L. Carter  
Acting Administrator

39 F.R. 20380  
June 10, 1974





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 74-10; Notice 5)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, to delay the effective date for a category of specialized trailers whose configuration makes compliance with the standard particularly difficult until September 1, 1976. A new definition is added to the standard to define the specialized "heavy hauler trailer" category.

The definition and effective date were proposed in a notice published May 17, 1974 (39 F.R. 17563). The proposed definition read:

"Heavy hauler trailer" means a trailer with one or more of the following characteristics:

- (1) Its brake lines are designed to adapt to separation or extension of the vehicle frame; or
- (2) Its body consists of a platform whose primary cargo-carrying surface is not more than 40 inches above the ground in an unloaded condition.

None of the comments directly addressed to specialized trailers objected to the 1976 date.

Wagner Electric suggested that the definition could be misconstrued to include trailers with bodies that consist of a cargo-carrying surface and sides and a header. It does appear that the definition can be more specifically stated, permitting only a header for safety purposes, and sides of a temporary nature. The definition has been modified accordingly.

Some comments recommended broadening the reach of the definition to higher trailers. Nabors suggested a specific exemption for pole trailers. Kornylak requested exemption of its Stradolift vehicle, and Bankhead requested exemption of auto-hauling trailers.

The suggestions to expand the definition to specific trailer types would broaden the exemp-

tion beyond what is necessary to implement the standard. The definition presently reflects the necessary design characteristics of specialized trailers which, as a whole, require more development before they can comply with the standard. Hauling automobiles, for example, does not require 15-inch wheels. A pole trailer which is not extendable does not require longer brake actuation and release times than the standard highway van.

Other comments recommended raising the 40-inch bed limit to accommodate more vehicles. The NHTSA has concluded that trailers with beds higher than 40 inches (including trailers whose beds are below 40 inches over the wheels but higher than 40 inches over the fifth wheel) can accommodate the new larger brake packages available at this time.

In consideration of the foregoing, Standard No. 121 (49 CFR § 571.121) is amended by a modification of the paragraph on the applicability of the standard and by the addition of a new definition. . . .

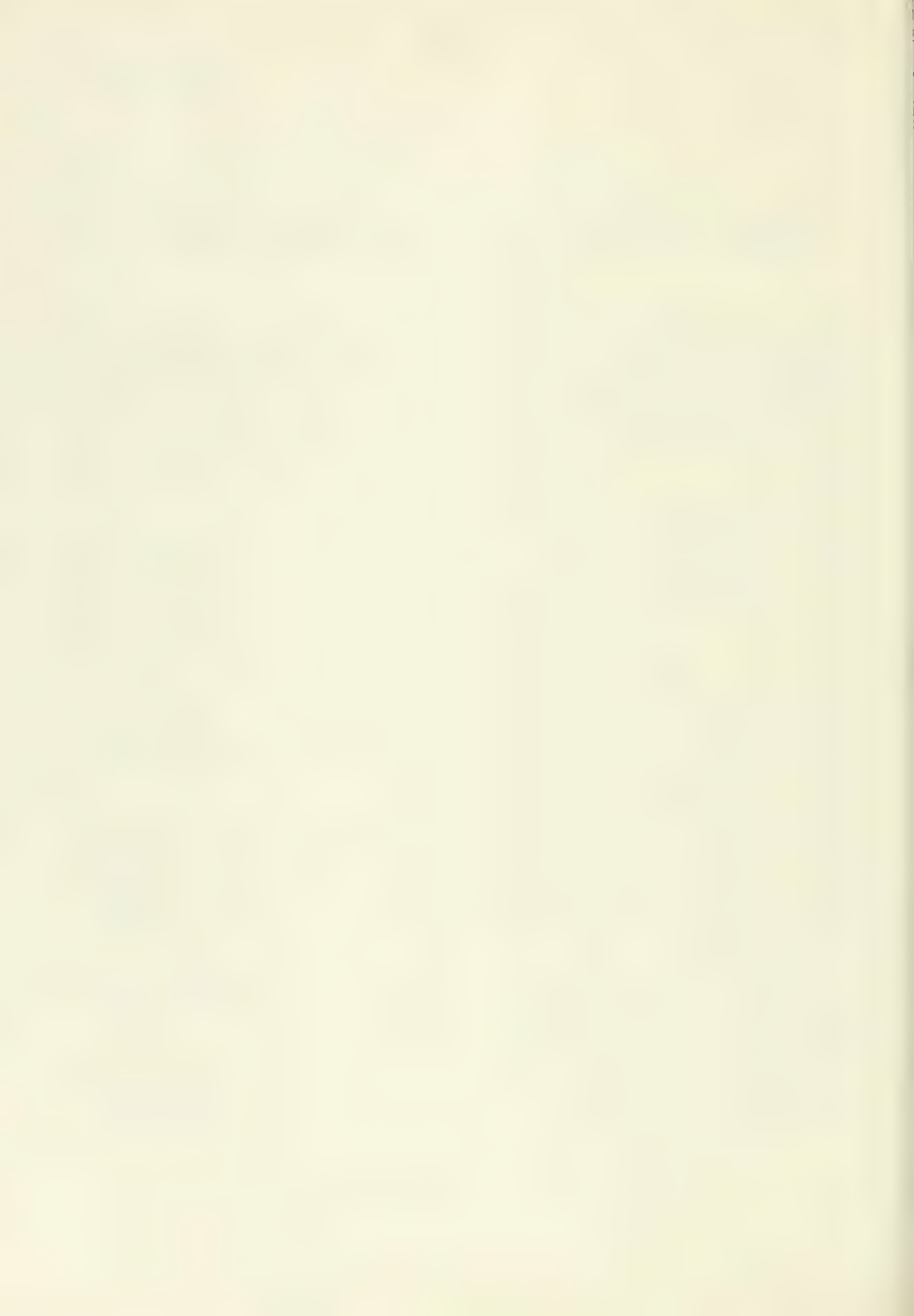
*Effective date:* January 1, 1975. It is found that this amendment causes no additional burden to manufacturers and, because the general effective date of the standard for all trailers is January 1, 1975, this delay of effective date for certain trailers must be effective sooner than 180 days of issuance and no later than January 1, 1975.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on July 30, 1974.

James B. Gregory  
Administrator

**39 F.R. 28161**  
**August 5, 1974**





# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121**

## **Air Brake Systems**

**(Docket No. 74-10; Notice 6)**

This notice responds to six petitions for reconsideration of recent amendments to Standard No. 121, *Air brake systems*, 49 CFR 571.121, which established a March 1, 1975, effective date for trucks and buses, and optional interim requirements until September 1, 1975, for trucks with certain heavy or front steerable drive axles. In addition, this notice also responds to several questions on the burnish procedure recently raised by International Harvester.

The NHTSA established the March 1, 1975, effective date for trucks and buses after comprehensive consideration of numerous petitions from manufacturers and users of air brake-equipped vehicles (39 F.R. 17550, May 17, 1974). Manufacturer concerns centered on the availability and reliability of components involved in the new brake systems, particularly antilock devices, and on leadtime necessary to modify vehicles to accept these components.

Ford Motor Company is the only manufacturer of air brake-equipped trucks which petitioned for reconsideration of the March 1, 1975, implementation date for the standard's basic provisions. After the time for petitions for reconsideration had closed, Chrysler Corporation reported on an accident which occurred during certification testing of a vehicle equipped with antilock devices, and urged the delay of Standard No. 121 for an indefinite period. The American Institute of Merchant Shipping also requested an indefinite delay in the standard's implementation.

Ford petitioned for a further 6-month delay in the standard as it applies to truck-tractors, and a one and one-half year delay as the standard applies to other trucks and buses. Ford asserts that the suspension and brake modifica-

tions necessary to meet the dry-stopping distance requirements will compromise vehicle handling and stability, increase the danger of load shifts, and force the introduction of antilock devices before Ford considers them reliable. The requested extension would be used to evaluate the effect of the new componentry on overall safety.

The issues in the Ford petition have been carefully considered by the NHTSA in the process of rulemaking and, with the exception of load shifting, were addressed in the preamble to the amendments which established the March 1, 1975, date. The NHTSA has reviewed each of Ford's concerns, and concludes that implementation of the standard as scheduled for trucks and buses is reasonable, practicable, and meets the need for motor vehicle safety.

With regard to the handling and stability problems experienced by some short-wheel-based vehicles in meeting the stopping distance requirements, the NHTSA maintains its determination that adequate time has been made available to make the major redesign necessary in some vehicles, or to make the decision to discontinue the production of models which are simply too short to meet the requirements despite design changes. International Harvester, in its comments on the rulemaking, indicated that it had been ready to meet the proposed January 1, 1975, effective date and would actually suffer economic losses in waiting for the March 1, 1975, implementation.

The availability and reliability of antilock systems which will be used by many manufacturers in meeting the requirements was questioned by Ford in its petition. In response to Ford's assertion that a manufacturer's report on field experience with 8,000 antilock units does

not appear in the record, a letter from Kelsey-Hayes (February 1, 1974) containing this information was placed in the NHTSA Docket Section before March 1, 1974. The NHTSA continues to monitor antilock production and testing and cannot agree that the evidence indicates antilocks will decrease the safety of the new trucks in highway operation. Since May, the NHTSA engineering staff has visited six of the seven major antilock manufacturers to discuss antilock reliability and availability. At least half of these manufacturers pointed out that their plants were prepared for full production to meet the September 1, 1974, date, and that they had had to delay production schedules because of the six-month delay. Low volume production is presently available to vehicle manufacturers for their testing and evaluation.

Concerning antilock reliability, a substantial amount of proprietary information was reviewed as well as the publicly-known information that no highway accident has been attributed to the failure of antilock devices. Kelsey-Hayes pointed out that it is selling approximately 250 axle units each month for retrofit. Following these visits, the NHTSA sent the seven major antilock manufacturers requests for reliability data under its investigatory authority, which will become part of the record although it may be of a proprietary nature which would justify not making it public. This data will show millions of axle miles of antilock operation with a malfunction rate comparable to other equipment presently in highway service, and no highway accidents attributable to the device.

Chrysler Corporation reported on a proving-ground accident on May 16, 1974, in which an antilock-equipped truck rolled over after its rear wheels locked and caused skidding during a stop from 60 mph. The manufacturer of the antilock system reported that the device functioned as it was designed to but in response to a false signal. The important point, however, as noted in the May rulemaking, is that the accident occurred as a result of rear-wheel lockup during a panic-type, full brake application that would also have occurred if the vehicle had not been equipped with antilock. In other words, a panic stop always involves the risk of uncontrolled skid due

to lockup, and the presence of the antilock only improves the chances of a safe stop in the vast majority of instances in which it functions properly.

Ford requested an interpretation of S5.5.1 of the standard that would permit use of a pressure limiting valve to the front axle that operates when it senses electrical failure of the antilock system. The NHTSA has advised Ford (and Bendix Corporation) that S5.5.1 does not prohibit use of such a valve designed to operate in the event of electrical failure.

Ford also raised the problem of load shift under heavy braking. The NHTSA has considered the effects of the standard and notes that, under normal circumstances, stops will continue to be made at the same deceleration as in the past, consistent with driver comfort and load stability. Only in emergency situations will the full torque of the new brakes be utilized and in this event, the NHTSA concludes that the shorter stopping distances outweigh the possible safety problem of load shift.

The Ford petition pointed out that any failure of component manufacturers to supply the new 121 components would make compliance with the standard impossible. As of this date the NHTSA finds that supplier production is on schedule and will provide components on time. As recently as July 26, 1974, Rockwell International assured the NHTSA that its production is on schedule.

For these reasons the Ford petition and Chrysler request are denied. The NHTSA would like to establish the issuance of this notice as the final form of Standard No. 121 with regard to its effective date and the stopping distance requirements, for purposes of review under § 105(a)(1) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. § 1394). Thus, while several areas treated later in this notice will be subject to further reconsideration, the effective dates and stopping distance requirements will be final as to any person who will be adversely affected by them.

While International Harvester supported the March 1, 1975, date for standard highway trucks and buses (it would have preferred a January 1,



1975, date), they did petition for reconsideration of the NHTSA decision to apply the full stopping distances to vehicles equipped with front steerable drive axles after September 1, 1975. White Motor Company and Diamond Reo Trucks, Inc., also petitioned for 1 year's delay in implementation of the full requirements for these axles.

The majority of front steerable drive axles are found on vehicles which use the road regularly at highway speeds and which require the same stopping capability as lighter vehicles. In most cases, their non-planetary construction permits an uncomplicated adaptation to the standard's torque requirements. Furthermore, one vehicle manufacturer indicates that it has successfully redesigned steerable drive axles in the 18,000- to 23,000-pound GAWR range to meet Standard No. 121. White, International Harvester, and Diamond Reo state that the lighter axles in this category are unavailable, but not technically unfeasible. The unavailability stems from supplier decisions to concentrate on the more common non-driving axles found on standard highway vehicles in great numbers. An August 8, 1974, letter from Rockwell Standard to Docket 74-10 supports the conclusion that the axles can be manufactured, but will not be available until September 1, 1976. Accordingly, the NHTSA has reconsidered the present effective date of September 1, 1975, for full requirements applicable to front steerable drive axles and delays for one year the full requirements for those axle sizes which are not available until September 1, 1976.

Diamond Reo and White also requested reconsideration of the implementation of full requirements for vehicles equipped with a front steerable non-driving axle with a GAWR of 16,000 pounds or more, which are subject to interim dynamometer requirements from March 1, 1975, to September 1, 1975. The manufacturers base their requests for a 1-year delay on difficulties in securing a proven brake assembly capable of handling the higher torque levels. B. F. Goodrich recently dropped development of its heavy air-over-hydraulic disc brake system, to which at least one truck manufacturer, White Trucks, was committed. White states that disc brakes are

necessary for heavy front axles and has encountered severe axle-to-axle imbalance problems in its attempts to use other disc brake assemblies at this date. A major axle supplier has notified the NHTSA that the axle itself can be ready by September 1975.

The NHTSA has evaluated the foundation brake assemblies available to this vehicle group and concludes that a year's field testing and experience is necessary and desirable to assure that the new components will perform as designed when placed in highway service. For this reason the full requirements of Standard No. 121 will become effective for vehicles with a front steerable axle of 16,000 pounds GAWR or more on September 1, 1976.

With regard to this vehicle group, International Harvester claimed that the requirement that the brakes be "fully applied" was unfairly introduced into the interim requirements and interferes with braking action. Apparently full pressure applications may cause erratic behavior in some large vehicles with very light bodies, during dry stops in the unloaded condition.

Full application is required to ensure that vehicles provide the lateral tractive capability of an unlocked wheel during panic braking. This interim requirement was proposed in March 1974 as relief from full requirements which have been in effect since February 1971. The NHTSA does not consider it unfair to propose and make final an optional stopping requirement which represents relief from more stringent requirements. More important, the NHTSA considers it crucial to maintain complete directional stability in a panic stop, loaded or unloaded, if the vehicle is unable to meet the stopping distance requirements in that condition. Accordingly, the International Harvester petition is denied.

Diamond Reo also requested that the interim stopping distances for standard highway vehicles be adopted as the full requirements. Their vehicles meet the shorter distances but not by a sufficient margin to absolutely assure them that every one of their vehicles will pass. The fact that the vehicles are capable of stopping well within the shorter distances persuades the NHTSA that this safety level can and should



be maintained. Manufacturers are required by the Safety Act to "exercise due care" in certifying that vehicles comply with the applicable standards (15 U.S.C. § 1397(b)(2)). In view of the statutory language, Diamond Reo's request for reconsideration is denied.

In a related matter, the NHTSA has been asked by the *Federal Register* to redesignate the present Table V as Table IIa, which is accomplished in this notice.

Manufacturers raised several matters which were not addressed by Notice 2 and are not, therefore, properly raised as petitions for reconsideration. The NHTSA finds it desirable, however, to respond to them in this notice, in view of the standard's imminent effective date.

Most important was a question by International Harvester in a July 27, 1974, visit by NHTSA engineers to their plant. They indicated that some 121 vehicles may have difficulty in achieving the required burnish temperatures because of the use of the automatic pressure limiting valve that tailors the torque at the front axle. The burnish conditions of Standard No. 121 essentially standardize the preparation of new truck, bus, and trailer brakes for testing under the standard.

In the absence of a specification for these valves, it appears that manufacturers have instituted various practices to assure uniformly good burnishes. It is apparent that different vehicles respond to the burnish procedure with distinctive problems and require solutions tailored to their particular brake packages.

From a regulatory standpoint, however, an optional procedure complicates enforcement of a standard, particularly where a manufacturer has tested one way and the NHTSA tests the other. Test results with the limiting valve, for example, may not be easily comparable with test results in which the valve was bypassed. Both the manufacturer and the NHTSA need a specification that permits flexibility in achieving a uniform burnish in different vehicles, but does not permit two burnish options.

To end this confusion, the NHTSA further specifies the burnish procedure to require that a limiting valve be in use except in the event the temperature of the hottest brake on a rear axle

exceeds the temperature of the hottest brake on the front axle by 125° F. In this way the manufacturer and the NHTSA will follow the same test procedure. It should be emphasized that this specification in no way invalidates the testing undertaken to date. Such data can be the basis of certification.

In answer to another International Harvester question, brake adjustments can be made during the burnishing to control brake temperatures. It should be noted that NHTSA is considering a limit on adjustments to three, to be made only during the first 250 snubs. Finally, the NHTSA has indicated to Kelsey-Hayes that it would add "after-stop" to the burnish procedures to describe the specified temperatures more precisely. The NHTSA intends to measure the temperatures within 30 seconds of brake release, but will not reject manufacturer readings taken at any time if they are reasonably related to the temperatures actually generated by the snubs. This latitude is necessary to avoid invalidation of manufacturer testing up to this time.

International Harvester asked that the parking brake requirements of S5.6.2 be modified to require 20 percent grade holding ability "to the limit of traction". The NHTSA has determined that the present grade holding capability is desirable, and it has already provided an alternative requirement in the standard that brakes with a specified static retardation force be provided on all axles. The NHTSA concludes that the option makes a reduction of the grade-holding requirements unnecessary.

Diamond Reo requested that air reservoir volume on trucks and buses be reduced from present requirements. The NHTSA has already reduced the volume from 16 times the combined service brake chamber volumes to 12 times that volume, and concludes that a further reduction is not in the interests of motor vehicle safety. The Diamond Reo request concerning the anti-lock electrical circuit has already been answered by a letter denial of June 28, 1974.

Wagner Electric requested a minor revision of Figure 1, Trailer Test Rig, which the NHTSA makes in the interests of consistency of terminology. The word "control" is substituted for "pedal".

Finally, the NHTSA has been receiving some indications that manufacturers may arbitrarily specify a higher GAWR than normal simply to avoid requirements of the standard. The NHTSA therefore takes this opportunity to explain the manufacturer's responsibility to specify the GAWR of axle systems on his products.

The NHTSA defines gross axle weight rating as follows:

"Gross axle weight rating" or "GAWR" means the value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Because the GAWR is measured at the tire-ground interfaces, it means that the tires, wheels, brakes, and suspension components are included in the determination. It is obvious that the GAWR of the whole system cannot exceed the rating of any one component, such as tires. Both the NHTSA in its compliance tests and defects investigations, and the Bureau of Motor Carrier Safety on the road, will judge the vehicle on the

basis of the values assigned. Therefore it is in the interest of the manufacturer to assign values which accurately reflect the load-bearing ability of the vehicle and its tires and suspension.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

*Effective date:* March 1, 1975. Because the Standard's effective date for trucks and buses occurs sooner than 180 days and because these amendments create no additional burden, it is found for good cause shown that an earlier effective date than 180 days from the date of publication is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on November 6, 1974.

James B. Gregory  
Administrator

**39 F.R. 39880**  
**November 12, 1974**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121****Air Brake Systems****(Docket No. 74-10; Notice 11)**

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.212, to establish a new test category (and an effective date) for highly specialized tractor-trailer vehicle combinations, and to specify modified brake retardation force requirements for trailers until September 1, 1976.

The National Highway Traffic Safety Administration (NHTSA) proposed these actions, along with other actions that deal with specialized trucks, in a notice published November 14, 1974 (39 F.R. 40168). The NHTSA is acting as soon as possible on the retardation force and integral tractor-trailer issues because they directly affect the manufacture of trailers, which will be subject to the standard's requirements on January 1, 1975. The issue of exemption for oversize and specialized trucks (which have a March 1, 1975, effective date) will be addressed in the near future by a separate notice.

The NHTSA takes note of its recent proposal and request for comments on a postponement of this standard (39 F.R. 43639, December 17, 1974). The NHTSA is proceeding with this rulemaking action independently of that proposal to maintain as much continuity as possible in the regulation as presently issued.

The manufacturers and users of auto transporter combination vehicles and the Truck Trailer Manufacturers Association supported the proposal to exempt "integral tractor-trailers" from applicability of the standard until September 1, 1976, because of their particular testing difficulties. It has been suggested that the term "integral tractor-trailer" should be replaced by a more descriptive designation of the combination vehicles in question. The NHTSA agrees and modifies the definition to refer to the transportation of motor vehicles, and to change the defined

term to "auto transporters." The comments requested deletion of a requirement in the definition which limited these vehicles to those designed "by a single manufacturer, or person who alters a certified vehicle." The comments expressed concern that the phrase would eliminate the manufacture of tractor and trailer portions separately. Some manufacturers also believed that the reference to "certified vehicles" meant that any incomplete truck tractor equipped with 121-type equipment would have to be certified upon completion by the manufacturer of auto transporters.

The cited requirement does not exclude manufacture by separate individuals of the two portions of the combination, although the preamble inadvertently referred to "trucks and trailers manufactured by a single manufacturer for use in combination." It is possible that one or more persons other than a vehicle manufacturer or alterer may be responsible for the integral design. The NHTSA therefore deletes the phrase in question to permit continued flexibility in the design of these vehicles.

The reference to alteration of a "certified vehicle" confused some businesses which modify stock truck-tractors for use in auto transporters. They believed that a completed vehicle that had been certified to meet Standard No. 121, or an incomplete vehicle with documents referring to Standard No. 121, could not qualify for an exemption as a portion of an auto transporter. In actuality, a complete and certified vehicle, or an incomplete vehicle, can be modified to become a portion of an auto transporter, which would thereby qualify for exemption whatever its previous status.

Bankhead Transportation requested clarification with regard to manufacture of new auto transporter trailers to be fitted to existing truck tractors that are modified to accept the new trailer. These trailers constitute a portion of an auto transporter and as such are exempt until September 1, 1976. The NHTSA has modified the language of S5.3 in one respect from that proposed, to make clear that a transporter trailer manufactured without an equivalent transporter tractor would be tested separately under the requirements of S5.3.2 after September 1, 1976.

The NHTSA also proposed that the retardation force requirements of the standard, which apply to trailers (and, of an optional basis, to a small category of large trucks until September 1, 1967), be somewhat reduced because of the degree of variability being experienced in brake lining performance. The NHTSA requested comments on lower values and on whether such new values should be permanent, or only temporary while further information is developed on variability.

With the exception of General Motors Corporation and Automotive Research Associates, Incorporated (which suggested changes in dynamometer procedures instead of values), the commentors supported the reduction of retardation force values for trailers. General Motors argued that brake force reductions of the trailer should not be undertaken without similar reductions in stopping distance requirements for trucks, and is particular towing vehicles.

The NHTSA, in an amendment published May 17, 1974 (39 F.R. 17750), has already acknowledged the variability of production brake assemblies on trucks and buses by establishing longer stopping distances for an interim period until September 1, 1975. The NHTSA recently denied a petition by Diamond Reo to make these longer distances the permanent values of the standard (39 F.R. 39880). A Paccar Corporation petition presently under consideration on the subject of stopping distances also raises the issue of relaxed stopping requirements. The NHTSA concludes that its decision on that petition will be responsive to the points raised by General Motors.

Several comments on the proposed lower retardation forces included data that further substantiate the determination that variability of

brake linings is not sufficiently small to permit 100 percent compliance of every brake assembly at the present values. Wagner Electric Corporation, which originally petitioned for use of the values proposed by the NHTSA, has submitted new data which support a slightly lower minimum force level to support the desired mean performance of approximately 60 pounds. Data supplied by Raybestos Manhattan demonstrate a variability to the 3-sigma limit of slightly more than 20 percent calculated by the NHTSA on earlier testing. Molded Materials Company disagreed that compatibility of combination vehicles required 60 percent mean retardation values, but supported the proposed lower minimum force levels as a means to achieve compatibility. Abex Corporation supported the lower values so that actual production experience could be accumulated as a basis for future changes.

The NHTSA concludes on the basis of submitted data that values slightly lower than those proposed will better accommodate the demonstrated variability of brake lining material. Therefore, values of 0.06, 0.13, 0.20, 0.27, 0.34, 0.41, and 0.47 will replace the present values for trailers.

Manufacturers and users of brake lining differed on whether the new values should permanently replace the previous values. The NHTSA did not receive conclusive information indicating that the variability in performance will remain in production units. The NHTSA concludes, therefore, that interim values will permit the accumulation of significant field experience on vehicle compatibility and lining variability, and that a judgment will be made on the basis of that data in the future.

Only Kelsey-Hayes commented on the proposal to apply these new retardation force values to trucks with heavy (or driving) front axles during their interim requirements. As a manufacturer of front axle brake assemblies for this vehicle category, Kelsey-Hayes pointed out that the revision was not supported for truck front axle brake assemblies and would require an unjustified retooling for a period of no more than 18 months. The NHTSA agrees that the data underlying the proposal supports a modification for trailer brake assemblies only. Accordingly

the NHTSA does not reduce the optional interim retardation force requirements for trucks specified in S5.1.3.2.

In a separate matter, Rockwell International Corporation asked whether the discussion of 100 percent compliance with Standard No. 121's retardation force requirements was a modification of earlier NHTSA discussion on the "due care" responsibility of each manufacturer to ensure that each of his products meets the requirements of the standard (39 F.R. 17750, May 17, 1974). The requirement to exercise "due care" that each vehicle comply with Standard No. 121 is a statutory requirement (15 U.S.C. 1397), and the above-cited discussion remains the NHTSA position.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571. 121) is amended. . . .

*Effective date:* January 1, 1975. Because of the imminent effective date of the standard for trailers (January 1, 1975), the National Highway Traffic Safety Administration finds, for good cause shown, that an effective date sooner than 30 days is in the public interest.

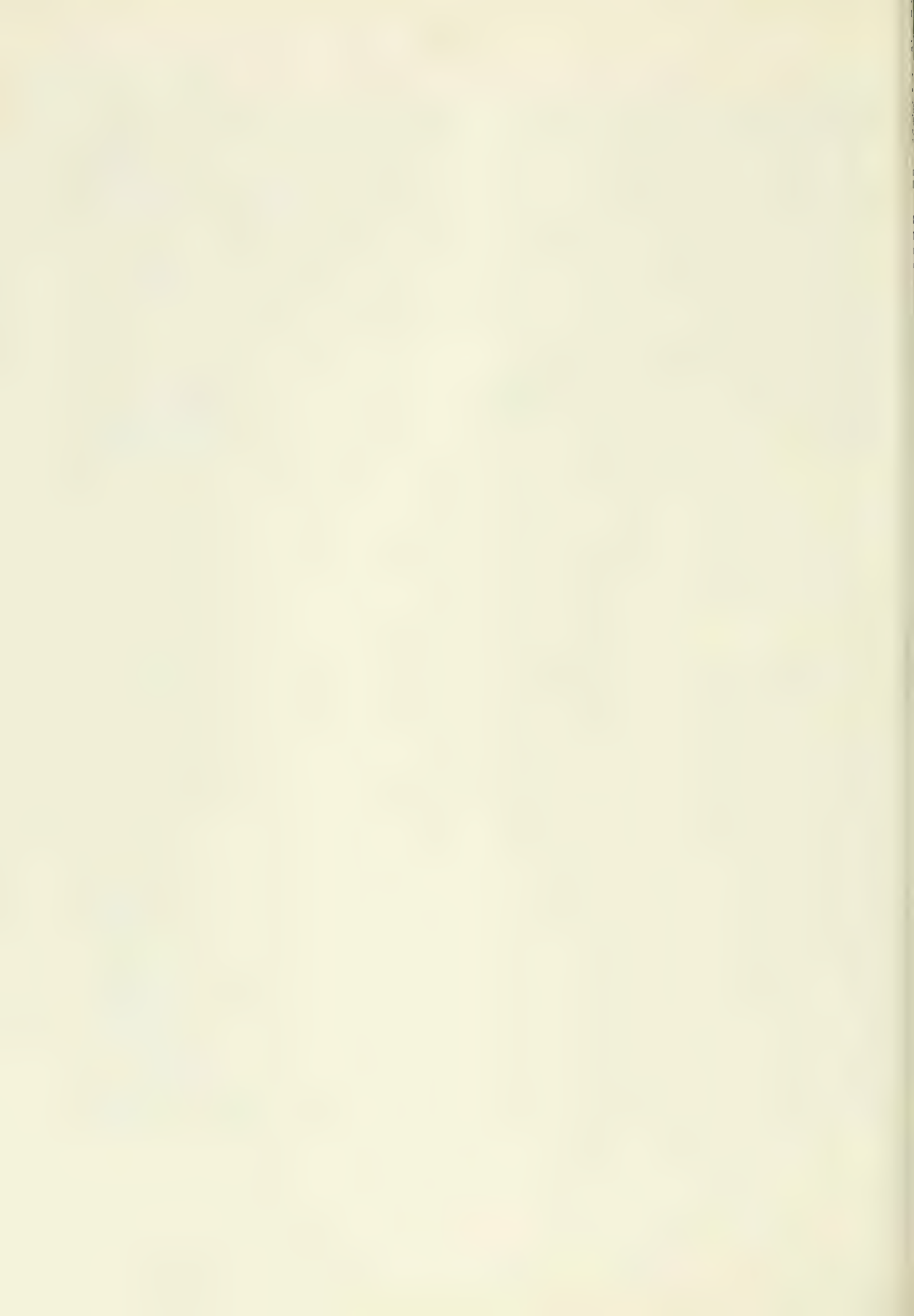
(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407) ; delegation of authority at 49 C.F.R. 1.51)

Issued on December 31, 1974.

James B. Gregory  
Administrator

40 F.R. 1246  
January 7, 1975





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121**

(Docket No. 74-10; Notice 12)

**Air Brake Systems**

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. 571.121, to delete as of September 1, 1976, the emergency brake option that for trucks and buses permits automatic application of the parking brakes in place of a modulated emergency brake system. A notice of proposed rulemaking to be issued shortly proposes modification of the air brake system parking brake requirements and the trailer emergency braking requirements.

Based on a December 1972 petition from the American Trucking Associations (ATA), the NHTSA proposed elimination of the automatic parking brake for use as an emergency braking capability (38 F.R. 14963, June 7, 1973). In response to comments on that proposal which stated that leadtime was insufficient to implement the proposal by September 1, 1974, the NHTSA indicated it would defer final action to a later date and issue any changes with an effective date beyond September 1, 1974 (39 F.R. 804, January 3, 1974). The NHTSA again indicated in May 1974 that "the majority of the changes proposed in response to the ATA petition continue to be viewed favorably." (39 F.R. 17550, May 17, 1974). The NHTSA has now completed its consideration of the modulated braking provision and hereby amends the standard as proposed in June 1973, with an effective date of September 1, 1976, to permit adequate time for engineering necessary changes. It appears, in fact, that the majority of new brake systems are designed to meet generally the modulated emergency brake requirements.

The fundamental change is elimination of the option that permits automatic application of the parking brakes in place of a modulated emergency brake system. The NHTSA agrees with

the ATA that a driver should not be forced to use two different methods of applying the emergency brakes, depending on what vehicle he is driving at the time.

In the parking brake system proposal to be published shortly, it is proposed that the parking brake provisions found as options in the present S5.7 be made mandatory in a revised S5.6 parking brake section. Thus the present S5.7 requirement that a vehicle with a modulated brake capability also have a parking brake capable of manual application at any service reservoir pressure level would be found in the parking brake section. Also the requirement that the parking brake be capable of application in the event of a failure of specific components common to the service brake and emergency braking systems would be moved to the revised parking brake section. Finally the requirement that a parking brake be releasable only if it can be reapplied would be found in the new parking brake provisions.

Several other requirements proposed in June 1973 for the modulated emergency brake system are found in this amendment. The modulated emergency brake must be applied, released, and be capable of modulation, by means of the service brake control. The NHTSA has concluded that the driver is most likely to maintain the best control of his vehicle when he can modulate any braking available to him through a single control. The emergency system must be capable of two full applications and releases in the event the service brake system fails. This ensures that a disabled vehicle can be safely moved off the roadway.

As proposed in June 1973 and made final in this notice, the emergency brake system of a

towing vehicle must operate in the event the trailer air control line or the trailer supply and control lines fail. These requirements ensure that a loaded combination vehicle can stop in specified distances with a failed control line, and that a loaded straight truck (capable of towing) or "bobtail" tractor-trailer is capable of stopping in the event a trailer breaks away. Additionally, the service brake control of a towing vehicle must be capable of modulating the brakes on a towed vehicle following a failure on the towing vehicle. Also, the emergency stopping distance requirement presently in the standard becomes the only permissible test of a truck or bus emergency braking system.

A new test condition has been added to specify when to vent the control and supply lines to atmosphere for test purposes.

As noted above, the majority of these changes appear to be incorporated in large measure in the design of the new brake systems. The NHTSA concludes that truck and bus manufacturers are capable of meeting these modulated brake requirements by September 1, 1976.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571.121) is amended. . . .

*Effective date:* September 1, 1976.

(Sec. 103, 119 Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407), delegation of authority at 49 C.F.R. 1.51 and 49 C.F.R. 501.8).

Issued on January 10, 1975.

James B. Gregory  
Administrator

**40 F.R. 2989**  
**January 17, 1975**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 74-10; Notice 14)

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. 571.121, to exempt a small category of oversize and construction vehicles from the applicability of the standard. The exemption criteria were proposed in a January 28, 1975, notice (40 F.R. 4153), which expanded the criteria for this specialized vehicle category in response to comments on an earlier exemption proposal (39 F.R. 40168, November 14, 1974).

In making the proposal, the NHTSA tentatively determined that the specialized configuration of this small category makes compliance with the standard so difficult and expensive that an exemption from the standard would be justified. It was noted that the vehicle function in these cases generally results in restricted operation on the highway (e.g., at low speed, in permit operation, or during daylight hours) and that as a result, vehicle exposure on the highway is limited.

The NHTSA proposed a series of criteria intended to comprehensively identify vehicles with these characteristics. Permanent exemption would be granted to any vehicle that has (1) an overall vehicle width of 108 inches or more, (2) a speed attainable in two miles of not more than 33 mph, (3) a speed attainable in two miles of not more than 45 mph, all-wheel drive, and no cargo- or passenger-carrying capacity, (4) an axle that has a GAWR of 29,000 pounds or more, (5) two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle; or (6) a steerable drive axle driven through gear reduction contained within the wheel.

Three of the numbered criteria ((3), (5), and (6)) were intended to describe the lighter and more maneuverable vehicles whose drive axle con-

figuration or high center of gravity make conformity with the standard expensive and difficult. An example of this vehicle type is the large, carrier-mounted mobile crane. Based on submitted comments, it appears that these criteria should be combined as a single compound criterion in order to avoid inequities in the applicability of the standard. Specifically, either of the criteria numbered (5) or (6) could, of itself, permit heavy or cargo-carrying vehicles on the highway at unlimited speed without 121-type brakes while far smaller vehicles would be subject to the regulation. To accomplish the rearrangement, the exception criteria numbered (3), (5), and (6) are combined in a new category (d) to require for this exception that an expected vehicle have a speed attainable in two miles of not more than 45 mph, no cargo- or passenger-carrying capacity, and either (1) all-wheel drive, (2) a steerable drive axle driven through gear reduction contained within the wheel, or (3) two or more front steerable axles.

It is recognized that total withdrawal of the 16,000-pound tandem steerable axle exemption would make those vehicles with an unlimited highway speed unavailable until the axles are developed or the vehicle speed is reduced to 45 mph. Therefore the NHTSA will make final its proposed 16,000-pound exemption, but only for the interim period until September 1, 1976.

With regard to the 45-mph maximum speed criterion, FMC Corporation suggested that the speed be raised somewhat to ensure that vehicles excepted on this criterion can use the interstate highway system. The NHTSA does not agree that it should encourage use on the interstate system of large, high-center-of-gravity vehicles that are not subject to a minimum braking standard. Accordingly, FMC's request is denied.

Little comment was received on the other criteria. Ford Motor Company suggested a 24,000-pound figure in place of the 29,000-pound proposal. For reasons cited in the January proposal in response to an identical request by Mack this request is denied.

To the degree that this amendment does not grant the requests for exemption raised by Marmon Transmotive in its December 23, 1974, letter to the Administrator, that petition is denied.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571.121) is amended. . . .

*Effective date:* March 1, 1975. Because these amendments relieve a restriction and because of

the imminence of the standard's effective date, it is found for good cause shown that an effective date sooner than 30 days from the date of their publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51.)

Issued on February 28, 1975.

James B. Gregory  
Administrator

**40 F.R. 8953**  
**March 4, 1975**

# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121**

## **Air Brake Systems**

**(Docket No. 74-10; Notice 15)**

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. § 571.121, in response to petitions for reconsideration of requirements established for trucks and buses, by revision of the retardation force requirements applicable to on/off highway vehicles until September 1, 1975, or September 1, 1976.

The National Highway Traffic Safety Administration (NHTSA) established the final form of Standard No. 121 for purposes of judicial review in November 1974 (39 F.R. 39880, November 21, 1974) (Notice 6). Notice 6 established interim stopping distance requirements for standard highway vehicles, and retardation force requirements for some on/off highway vehicles. Petitions for reconsideration of the decision were received from White Motor Corporation, Mack Trucks, International Harvester, PACCAR Corporation, Diamond Reo, and Breeze Corporations. General Motors effectively requested reconsideration in its response to a separate November notice (39 F.R. 40168, November 14, 1974) (Notice 7) by supporting reduced trailer requirements only with corresponding reduction of truck stopping distance requirements.

General Motors, in its response to Notice 7, indicated that similar 121 vehicles can register as much as a 20-percent difference in stopping distances as a result of uncontrolled variability in brake component performance. International Harvester, which until recently had supported 5-percent longer stopping distances on an interim basis, now points to certain variables, including brake linings, in requesting longer distances on a permanent basis. Diamond Reo reported the same experience in its comments to Notice 2 of Docket No. 74-10. PACCAR requested that S5.3 (stopping distance) be "temporarily repealed"

and that longer stopping distances be considered for the future. The NHTSA concludes that PACCAR's request is essentially a petition for rulemaking to increase the stopping distances on a permanent basis.

These positions raise issues which can arise whenever a standard is first implemented: (1) that production variables are so great that inordinate compliance margins are required and (2) that the brake packages necessary to achieve these compliance margins are so aggressive that the handling qualities and durability of affected vehicles are significantly degraded. The NHTSA is, of course, interested in receiving on a continuing basis any new technical information (particularly test data on production vehicles) that bears on these important safety issues. Based on the information submitted to date, however, NHTSA is not prepared to grant the outstanding petitions at this time.

PACCAR also requested that the stopping distance requirements be delayed until the performance of antilock systems and certain test procedures, conditions, and the control trailer test device are specified in areas considered deficient by PACCAR. While these issues might appropriately be considered for future rulemaking, the NHTSA does not agree that change of these important elements of the standard should delay orderly implementation of the standard. Accordingly, the PACCAR request in these areas is denied.

The second area of the standard in which manufacturers seek reconsideration is limited relaxation of requirements for vehicles with front steerable drive axles (S5.3.1.2). Based on unavailability of this axle design, vehicles manufactured before September 1, 1975, with a front



steerable drive axle of any size may meet retardation force requirements in place of stopping distance requirements. Because of unavailability of the lighter front driving axles for a greater period, vehicles manufactured before September 1, 1976, with a front steerable drive axle with a gross axle weight rating (GAWR) of less than 18,000 pounds may meet retardation force requirements in place of stopping distance requirements.

Diamond Reo, International Harvester, and Mack Trucks, Inc., now request that the heavier axles also be permitted relaxed requirements until September 1, 1976. White Motor Company in its response to Notice 10 of Docket No. 74-10 requested the relaxed requirements until September 1, 1977. The NHTSA indicated in Notice 6 that this axle type is available and has been offered by Oshkosh Truck Company to the other manufacturers of this vehicle class. While Diamond Reo does not indicate it considered the Oshkosh axle, the other manufacturers indicate that redesign of their limited vehicle output in this area to accept the Oshkosh axle would be unjustified because of cost. Oshkosh, on the other hand, has offered to provide, at cost, technical assistance in the installation of Oshkosh axles to non-Oshkosh pilot test vehicles, and consultation and review of test data obtained from truck-manufacturer-conducted tests.

The NHTSA concludes, based on all information available, that the axle is available at this time and that sufficient leadtime has been made available for the location and testing of an axle of this type. The manufacturers who request further delay do not claim that the installation is technologically unfeasible or otherwise impracticable. Although they cite adverse economic consequence for the limited numbers of vehicles they produce in this category, this argument does not consider the major economic consequences for the Oshkosh Company, who state that 72 percent of their vehicle production would be adversely affected by any further delay. The petitions of White, International Harvester, Diamond Reo, and Mack are accordingly denied.

Due to unavailability until September 1, 1976, front steerable non-driving axles with a GAWR in excess of 16,000 pounds are permitted the same

relaxed requirements as the driving axles just discussed. White Motor Corporation, in its comments to Notice 10 of Docket No. 74-10, requested the relaxed requirements be extended to September 1, 1977, because of the long leadtime associated with manufacture of these vehicles. The NHTSA will monitor the availability of these axles to ensure their readiness for September 1, 1976, and will consider a later effective date for them if they are not available as presently scheduled. At this time, however, it appears that the axles will be ready sufficiently in advance of September 1, 1976, to permit satisfaction of the full requirements on that date. Accordingly White's petition is denied.

As earlier noted, both the vehicles equipped with certain driving or non-driving front steerable axles are permitted to meet retardation force requirements in place of distance requirements for an interim period. A reduction of these retardation force requirements was the subject of a proposal in Notice 7, which was acted on for trailers in Notice 11 (40 F.R. 1246, January 7, 1975). It was concluded that no argument had been made for a temporary reduction of retardation forces on the front axle of heavy trucks, most of which are integral trucks which experience high levels of dynamic load shift during braking. Comments by PACCAR to Notice 6, however, emphasized that retardation force requirements at the rear axle could be reduced because the load shift off the rear axle effectively results in over-torque of that axle.

The NHTSA's intent in substituting retardation force requirements for stopping distance is to ensure the best braking that is presently available, and it appears that rear brake retardation requirements may, in some cases, inhibit the tailoring of brake systems on different vehicles to achieve this goal. The most satisfactory means to reduce rear axle requirements while maintaining front axle requirements is to eliminate requirements for the vehicle as a whole, to permit the manufacturer latitude in selecting retardation force requirements at the rear axle. The present requirements for front axle retardation forces remain in the standard, and by this notice, the NHTSA deletes the requirement for retardation force values for the vehicle as a whole.

PACCAR requested complete withdrawal of the retardation force requirements, as well as the brake power and fade requirements as they affect all trucks. The NHTSA, of course, considers these characteristics of a brake system fundamental, and does not agree that the requirements are impracticable or should be withdrawn. PACCAR's request is therefore denied.

With regard to the vehicles that may meet retardation force requirements in place of stopping distances, International Harvester requested confirmation that S6.3.1.2 is an option that the manufacturer may choose to ignore in the loaded or unloaded condition if the vehicle in question meets the stopping distance requirements in that condition. This agency stated in the preamble to Notice 6 that "the NHTSA considers it crucial panic stop, loaded or unloaded, if the vehicle is to maintain complete directional stability in a unable to meet the stopping distance requirements in that condition." International Harvester's understanding of this language is correct.

PACCAR requested deletion of brake actuation requirements as redundant in view of stopping distance requirements. The NHTSA has considered elimination of the requirements previously, and concluded at that time that the requirement should be maintained (37 F.R. 3905, February 24, 1972). At this time the actuation requirements ensure fast braking on the vehicles under S5.3.1.2 which need not meet stopping distance requirements. The NHTSA will consider this PACCAR request for future rulemaking but does not act on the petition for amendment at this time.

Finally, PACCAR requested specification of antilock performance characteristics. The standard does not require antilock systems, and the NHTSA has concluded that specification for manufacturers who utilize these devices would be design restrictive, without a corresponding safety benefit. No manufacturer other than PACCAR indicates that a safety need exists to specify the cycling of antilocks, and the NHTSA is unable to determine from the PACCAR petition what evidence exists that antilock specification would improve vehicle handling. PACCAR's petition is accordingly denied.

In areas unrelated to the petitions for reconsideration, the NHTSA corrects an error in S6.1.8.1 and adds a clarifying word to S5.7.1.2, without in any way changing the requirements of those paragraphs.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. § 571.121) is amended. . . .

*Effective date:* March 21, 1975. Because of Standard No. 121's March 1, 1975, effective date and because this order relieves a restriction, it is found for good cause shown that an effective date sooner than 30 days from the date of publication of that order is in the public interest.

(Sec. 103, 119, 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51).

Issued on March 14, 1975.

James B. Gregory  
Administrator

**40 F.R. 12797**  
**March 21, 1975**





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 74-10; Notice 16)

This notice responds to three petitions for reconsideration of the National Highway Traffic Safety Administration's December 31, 1974, decision to implement Standard No. 121, *Air brake systems*, as scheduled on January 1, 1975, for trailers and on March 1, 1975, for trucks and buses. The petition of American Fire Apparatus Company for reconsideration of the September 1, 1975, effective date for fire fighting apparatus is granted for a period of six months. The petitions of the Milk Industry Foundation and of Representative James H. Quillen for delay of the standard as a whole are denied. The petition of White Motor Corporation has already been responded to by Notice 15 of Docket No. 74-10 (40 F.R. 12797, March 21, 1975).

The Milk Industry Foundation (the Foundation) requested delay of the standard as it applies to trucks and buses until March 1, 1976, to permit further testing of the new braking systems (and redesign as necessary) and to conduct an analysis of the economic impact of the standard. The Foundation believes that insufficient time has been allowed for vehicle testing.

The NHTSA has evaluated the readiness of manufacturers to meet the standard throughout the four years since issuance. The original January 1, 1973, effective date was delayed until September 1, 1974. In early 1974, the vehicle and component test programs involved in implementation were again evaluated, and the NHTSA proposed delay of the effective date to January 1, 1975 (39 F.R. 7966, March 1, 1974) (39 F.R. 17563, May 17, 1974). Based on submitted comments, it was determined that a March 1, 1975, effective date for trucks and buses, and a January 1, 1975, date for trailers would permit adequate time to complete preparations for the standard's imple-

mentation (39 F.R. 17750, May 17, 1974) (39 F.R. 20380, June 10, 1974). These delays were undertaken although one manufacturer expressed readiness to meet the September 1974 date, and International Harvester, the largest manufacturer of air-braked vehicles, expressed readiness to meet the January 1, 1975, effective date. This decision was reevaluated in November 1974 and found to remain valid, although a few larger vehicle types were permitted a later date (39 F.R. 39880, November 12, 1974).

The Foundation also requested that the standard be delayed until its economic impact is evaluated. The NHTSA conducted an evaluation of economic impact shortly before implementation of the standard (39 F.R. 43639, December 17, 1974) and, based on several hundred comments, concluded that the standard should be implemented (40 F.R. 1248, January 7, 1975). The NHTSA disagrees with the Foundation that the evaluation should have been conducted in accordance with Executive Order 11821 (on inflation impact studies) when the final criteria and procedures for implementation of the Order were not yet established. The NHTSA has committed itself to continue monitoring the effectiveness of its standard in accordance with its statutory mandate, with a view to identifying any modifications that would lower costs while achieving comparable levels of safety.

As indicated by the submissions of the Milk Industry Foundation, there has evidently been much confusion among user groups such as the dairy industry over the effect of the braking standards on their operations. In order to meet the requirements that a vehicle stop in a specified distance when tested by the government, chassis manufacturers have in some cases specified center

of gravity heights for conformity purposes that are lower than the loaded center of gravity of trucks that these operators are accustomed to using. The body builders who complete and certify the trucks have passed these center of gravity specifications on to the user groups. This has given rise to fears on the part of the dairy industry and others that they must reduce the loads carried on their trucks.

Actually, this is neither the legal effect nor the intended policy effect of the standard. The standard does not regulate the manner in which trucks are loaded or used on the road, and users are free to use their own judgment in loading their trucks, as they have been in the past. The standard is designed so that a properly-designed vehicle which satisfies its performance requirements under the conditions stipulated for compliance testing will perform safely under all reasonable conditions or real world use. Trucks equipped with the stronger and better-modulated brakes required by the standard, when loaded similarly to those in the past, should in fact be much safer both for their occupants and for the rest of the driving public than comparable vehicles were before. If the NHTSA should discover vehicles being produced that do not perform safely when loaded in a normal manner and can establish that this condition is attributable to deficiencies in vehicle manufacture or design, it can proceed against their manufacturers under its safety-related defect jurisdiction.

Representative Quillen requested consideration of a significant postponement of the standard, believing that a delay would increase truck sales. An examination of the truck market indicates that several months' inventory of trucks manufactured without the new systems remained unsold on March 1, 1975, suggesting that the economic downturn, rather than the new systems, accounts for many lost sales. The American Trucking Associations statistics on general freight tonnage indicate a steady decline in highway tonnage from the high figure reached in November 1973. It does appear that some of the slowdown is at-

tributable to "pre-buying" of trucks to avoid Standard No. 121, but this effect would occur whatever the date of implementation. Accordingly the petitions of the Milk Industry Foundation and Representative Quillen are denied.

American Fire Apparatus Company has requested that the NHTSA reconsider its decision to implement the standard as scheduled, so far as it applies to fire fighting vehicles. NHTSA policy has been to grant fire fighting vehicles a minimum of two years from the issuance of any standard to achieve compliance because of the unique leadtime problems associated with the industry. (49 CFR § 571.8). On this basis, the NHTSA granted a delay of the effective date from September 1, 1974, to September 1, 1975, for these vehicles at the request of American Fire Apparatus (39 F.R. 17750, May 17, 1974). At the same time the general implementation date was extended six months. The NHTSA agrees that fire fighting apparatus is entitled to a full year's delay because of its long leadtime problems.

By this notice, the NHTSA denies all outstanding petitions for reconsideration of Standard No. 121's effective dates, with the exception of the date for fire fighting vehicles.

In consideration of the foregoing, Standard No. 121 (49 CFR § 571.121) is amended. . . .

*Effective date:* June 16, 1975. Because the previously established effective date for fire fighting apparatus was less than 180 days after the date of publication of this amendment in the *Federal Register*, it is found for good cause shown that an effective date less than 180 days from the date of publication is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51).

Issued on May 12, 1975.

James B. Gregory  
Administrator

40 F.R. 21031  
May 15, 1975



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 74-10; Notice 17)

This notice responds to six petitions for reconsideration of a recent amendment of Standard No. 121, *Air Brake Systems*, 49 CFR 571.121. That amendment deleted as of September 1, 1976, the emergency brake option that permits automatic application of parking brakes in place of a modulated emergency brake system on trucks and buses (40 FR 2989, January 17, 1975). In addition, that notice standardized the operation of the emergency brake control, specified a minimum number of emergency brake applications and releases, and provided for the integrity of the towing vehicle braking system in the event of failure of the air lines to the towed vehicle. On the basis of information and arguments presented by several petitioners, the National Highway Traffic Safety Administration (NHTSA) hereby withdraws the amendment that specified a minimum number of emergency brake applications and releases.

None of the petitions for reconsideration objected to the NHTSA's deletion of automatic parking brake application as a means of providing emergency braking capability. There were no objections to the specification that the emergency brake system control be the same control as that for the service brake system. These provisions remain unchanged, and will become effective September 1, 1976.

The standard tests the emergency braking capability of a vehicle by introducing a "single failure in the service brake system." Bendix Corporation requested that this requirement be replaced by a requirement for emergency braking capability "with either circuit's reservoir at zero psi." Presumably Bendix is suggesting that the "split system" design found on today's air-braked trucks be tested by draining either side

of the system. Standard No. 121 does not specify a particular type of emergency brake system and cannot therefore specify failing any particular component. The NHTSA believes a vehicle should be capable of making stable in-line stops within the specified distance with a failure in any hose or reservoir in the service brake system. For instance, a failure in the air hose to the right front wheel should not make it impossible for a driver to keep the vehicle within a 12 foot wide lane. The agency does intend to clarify the status of various air lines in powered vehicles, particularly towing vehicles, to answer questions raised by International Harvester and the State of California concerning service brake system failure. These clarifications will appear in an upcoming notice on parking brake systems.

International Harvester, Ford, Midland-Ross, and Bendix objected to the requirement of S5.7.3 that requires the emergency brake system to be capable of not less than two applications and releases, as determined by brake chamber air pressure of 60 psi or more during the pressure phase of operation, and brake chamber air pressure of not more than 1 psi during the pressure release phase of operations. The manufacturers (and the American Trucking Associations) were concerned that the specification of 1- to 60-psi values was design-restrictive and would force substantial redesign of vehicles before the existing new designs can be thoroughly tested. Some of the petitions questioned whether the test would be conducted statically or dynamically.

The NHTSA is concerned that manufacturers not be unduly burdened with modifications to their systems during the initial introduction period of the standard. The agency has regularly indicated in its correspondence that it is monitor-



ing implementation of the standard to minimize disruption and costs while maintaining the standard's safety benefits. The maximum and minimum pressure values in question were specified simply as objective testing criteria and are not intended as design restrictions that fulfill a safety function.

In view of the redesign problems noted and their accompanying disruption, the NHTSA withdraws the application-and-release specification and will not reestablish it without further notice and opportunity to comment. (In answer to Bendix's question, it is noted that the 60 psi value in the pressure release phase was not intended to replace the "zero-torque" criterion for release of spring brakes.)

Midland-Ross, International Harvester, and Ford expressed several objections to the three requirements of S5.7.4 and the related test conditions of S6.1.14. The requirements are intended to assure that a combination vehicle remains capable of emergency braking performance in the event of hose failure between the towed and towing vehicles, including failure of both hoses due to trailer breakaway.

Comments incorrectly assumed that the requirements specify modulation of the trailer braking system in the event of hose failure under S5.7.4(b) and (c). In fact, section S5.7.4 does not require trailer braking requirements, but only specifies that a towing vehicle meet the enumerated requirements under certain conditions.

To eliminate confusion about the role of trailers in these tests, sections S5.7.4(a) and (b) are hereby revised to make it clearer that the vented line(s) to the trailer are only test conditions under which the towing vehicle must demonstrate emergency braking stopping distance capability. To eliminate a separate source of confusion in section S5.7.4(a), which is intended to simulate trailer breakaway, the section is also revised to eliminate an incorrect requirement for testing with a failed control line and an intact trailer supply line.

Midland-Ross and International Harvester objected to the test conditions of S6.1.14, which underlie S5.7.4(a) and (b). The S6.1.14 procedure is intended to simulate a trailer breakaway or, in the alternative, a failed control line on a

loaded combination vehicle. International Harvester expressed the belief that five new tests were thereby added to the standard. It is now made clear that only one additional test of a single-unit vehicle capable of towing is required, and two additional tests of a truck tractor are required. These tests are conducted in the test sequence at steps 4(e) (loaded) and 6(e) (unloaded).

International Harvester questioned as unrealistic the criterion in S6.1.14 that specifies a 1-minute delay in braking following rupture of a brake line. The NHTSA recognizes that the towing vehicle protection system is expected to act in much less than 1-minute to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle. The 1-minute interval is intended only to permit adverse "testing-to-failure" of an inadequately designed system. As a practical matter, the NHTSA will test when air pressure is lowest during the 1-minute period.

Midland-Ross implied in its comments on S6.1.14 that the S5.7.4(a) test would be conducted with a trailer attached whose emergency brake system is activated during testing. As noted earlier, S5.7.4 applies only to a towing vehicle and only its brakes are tested. In S5.7.4(a), no trailer is attached to the towing vehicle (simulating a breakaway). In S5.7.4(b), a trailer is attached (simulating a failure), but only tractor brake activation is permissible.

Midland-Ross expressed the belief that S5.7.4 (c) requires modulation of the trailer brakes in the event of a failed air control or supply line. In fact, the section only requires that a towing vehicle be capable of modulating the air in the supply or control line following a single failure in the service brake system on the towing vehicle, but does not require modulation of the towed vehicle emergency brake system under any circumstances (including control line failure). The requirement ensures that a single failure in the truck itself will not prevent modulation of an unimpaired system from the towing vehicle protection system rearwards. A clarification has been added to limit the single failure to the service brake system of the towing vehicle, not including either of the air lines to the towed vehicle.

Because several modifications are being made to the requirements of S5.7 as previously published, the NHTSA is republishing the entire provisions of S5.7 as they will become effective September 1, 1976, although paragraphs S5.7, S5.7.1, S5.7.2, and S6.1.14 remain unchanged.

In consideration of the foregoing, S5.7 of Standard No. 121 (49 CFR § 571.121) is amended, effective September 1, 1976. . . .

*Effective date:* September 1, 1976.

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(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at CFR 1.51.)

Issued on July 23, 1975.

James B. Gregory  
Administrator

40 F.R. 31771  
July 29, 1975





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121****Air Brake Systems****(Docket No. 75-16; Notice 2)**

This notice amends Standard No. 121, *Air Brake Systems*, 49 CFR 571.121, to establish new service brake system stopping distances until January 1, 1978, and increase brake actuation and release times on trucks, buses, and trailers. This notice also excludes from the standard trailers with an unloaded vehicle weight that is not less than 95 percent of the gross vehicle weight rating (GVWR), and any other vehicle with an unloaded vehicle weight that is not less than 95 percent of the GVWR and which has a maximum speed of 45 mph.

The NHTSA proposed reduction of Standard No. 121's stopping distance requirements (40 FR 24915, June 11, 1975), because data submitted by manufacturers of air-braked vehicles and air brake components indicated that variability of performance of certain braking and related components could in some vehicles necessitate more aggressive brake packages than are desirable to achieve the stopping distances contemplated in development of the standard. The agency also proposed increases in permissible brake actuation times to promote optimum cycling of the anti-lock systems used by most manufacturers in meeting the stopping distances. At the same time, the agency denied the petitions of the American Trucking Associations (ATA) and Consolidated Freightways (Consolidated) for extension of the required stopping distances as necessary to eliminate the necessity of high-torque brakes and anti-lock systems, and for suspension in whole or part of the standard's requirements. The denials were based on NHTSA's view that increased directional stability is critical to improvement of brake system performance on heavy vehicles, particularly articulated vehicles, that share the highway with passenger cars and other light vehicles.

Vehicle manufacturers and component suppliers supported without exception the increase in stopping distances. Additional discussions and data submitted by some manufacturers indicate that substantial effort is being made to identify and control all of the variables which affect compliance of air-braked vehicles with Standard No. 121. Most manufacturers recommended that the proposed extended distances be made permanent, but the NHTSA concludes that insufficient data exist at this time on which to base such a decision. Accordingly, the stopping distances are modified as proposed for a period that ends January 1, 1978. The NHTSA does not, therefore, accept the recommendations of Freightliner and Mack for longer distances, or the Freightliner recommendation for testing at 55 mph.

The proposed language has been modified to specify correctly the NHTSA's intent to extend service brake stopping distances on a skid number 75 surface for all vehicles under S5.3.1.2 and S5.3.1.3. Also, the additional sentence proposed for S5.3.1.3 was essentially redundant in view of the modifications to Table IIa, and that sentence has been deleted.

Manufacturers also supported the proposed increase in permissible brake actuation timing from 0.35 to 0.40 seconds for trucks and buses, from 0.25 to 0.35 seconds for trailer converter dollies, and from 0.25 to 0.30 seconds for trailers other than trailer converter dollies. The ATA recommended establishment of a minimum as well as maximum limit. While this suggestion may have merit, the NHTSA does not have sufficient time at this point to fully consider the suggestion, and will therefore treat it as a petition for rulemaking.

Bendix suggested that the increased actuation be permitted only for an interim period, but the NHTSA has evidence of degraded performance generated by the present timing which justifies a permanent change. Bendix is requested to submit any data for consideration that support its view that superior systems will exist by January 1, 1978, that provide both a faster and smoother response.

Freightliner Corporation repeated its view that actuation and release times are design-restrictive without corresponding safety benefit. While the NHTSA is willing to consider Freightliner's view for future action, it is noted that the ATA suggestion of minimum and maximum limits conflicts directly with Freightliner's point of view. In any case, elimination of these requirements was not contemplated by the scope of the proposal and will not be undertaken at this time.

Several manufacturers indicated that the petitions for longer actuation time implied the need for an increase in brake release times as well. White Motor Corporation supplied data substantiating the view that optimization of increased brake actuation times depends in part on design freedom to increase the release time in the necessary valving. Although increased release times were not proposed by the June notice, an increase in release times comparable to actuation times was contemplated by the intent of the modifications to permit somewhat slower valve action. To accomplish the intended revision, the NHTSA concludes that it is in the public interest to modify both the actuation and release time of S5.3.3 and S5.3.4 by an increase in permissible timing of 0.05 seconds. Fruehauf's suggested increase in trailer timing to 0.35 will be further considered, but the NHTSA does not believe it necessary to act on this level of increase without benefit of comments by interested persons.

The ATA, Consolidated, the Milk Industry Foundation, and Hackney Brothers submitted arguments that the stopping distance and brake timing modifications were insufficient to solve fundamental cost and reliability problems attributed by them to Standard No. 121. The ATA cited recall campaigns of antilock systems as evidence that the presence of high-torque front brakes on some trucks creates safety problems in the event of antilock malfunction. The ATA

also asserted that "no lockup" performance on trailers contributes insignificantly to highway safety, and asked that antilock, if mandated, be required only on a vehicle's drive axles.

Consolidated relied on a manufacturer's statements of vehicle instability with the 121 brake systems as a ground for suspension of the standard. The company also cited cost estimates for the standard, and requested that they be substantially reduced by dropping the "no lockup" requirement entirely, or requiring it only on the vehicle's drive axles, and by extending stopping distances to eliminate the requirement for front axle 121-type brakes.

The NHTSA has undertaken an extensive evaluation of the standard's effect on truck braking characteristics. One element of that evaluation is testing by the NHTSA's Safety Research Laboratory of pre-121 and 121-equipped truck tractors. One series of tests (on a dry surface with a skid number somewhat higher than 75) included a stop from 60.8 mph in 231.2 feet by a 121-equipped International Harvester tractor (with front axle antilock disconnected and a full brake application) and a 121-equipped trailer in which the front wheel brakes never locked up. This experience indicates that 121-type front brake package need not be so aggressive as to create a safety hazard in the event of an antilock malfunction which escapes the notice of the driver.

The NHTSA's monitoring of the standard's implementation also supports NHTSA's position that the malfunctions experienced in initial antilock production and installation are an inevitable consequence of the introduction of a new system in high production. Those malfunctions that have been determined to be safety-related and that could result in unsafe highway operation have been recalled for remedy by the manufacturers concerned.

The NHTSA has evaluated Consolidated's revised cost objections to the standard. The information submitted does not modify the NHTSA's earlier conclusions. Accordingly, the NHTSA reaffirms its decisions not to revise or revoke the standard as requested by the ATA, Consolidated, the Milk Industry Foundation, or Hackney Brothers.



Consolidated characterized its comments as both a petition for reconsideration and, in the alternative, as a petition to modify the standard. A petition for reconsideration may under 49 CFR 553.35 be submitted in response to a "rule" issued by the agency, but the denial of a petition is not itself a "rule" within the meaning of that section. Therefore Consolidated's "petition for reconsideration" is invalid. Considered in the alternative as a petition for rulemaking to modify the standard, the NHTSA denies the petition for the reasons noted.

Other comments to the docket requested changes to the standard which the NHTSA will consider further but cannot dispose of at this time. The revisions in this notice must be issued prior to September 1, 1975, so that manufacturers are not required to meet the 245-foot stopping distance which becomes effective September 1, 1975. The issues, in addition to others noted earlier, that will be further considered are: (1) Freightliner's request for deletion of the dynamometer requirements for the front axle; (2) PACCAR's request for modification of dynamometer requirements on the drive axles; and (3) several manufacturers' requests for a decreased grade in the parking brake requirement. The NHTSA does not agree with Freightliner that the test surface and control trailer specifications are insufficiently objective, or that the wet surface and emergency brake stopping distances need to be increased. Testing by the NHTSA Safety Research Laboratory does not indicate a need to increase these distances. The agency will, of course, continue to evaluate any new data that indicate more objective specifications can be reasonably implemented, or that longer distances are advisable.

The third proposal for modification of the standard was revision of the standard's applicability to exclude trailers with a GVWR of 10,000 pounds or less, trailers with an unloaded vehicle weight that is not less than 95 percent of its GVWR, and any other vehicle that has a maximum speed of 45 mph, an unloaded vehicle weight that is not less than 95 percent of its GVWR, and no passenger-carrying capacity.

No comments opposed the exclusion of trailers whose unloaded vehicle weight is not less than

95 percent of the GVWR, and the standard is accordingly amended to exclude this vehicle group.

The State of California objected to exclusion of light trailers (GVWR of 10,000 pounds or less) on several grounds. Their comments point out that a light trailer built for low density loads can be dangerously overloaded. The State also cited that ease with which higher GVWR trailers could be derated in order to take advantage of the exclusion for lighter vehicles. California also noted the increased complexity of enforcement of the standard with added exclusions of this type. Altec Industries, which petitioned for the exclusion, argued that the exclusion should be broadened to 15,000 pounds GVWR. On balance, the NHTSA agrees with California that the exclusion might create more safety problems than safety benefit. In view of this conclusion, the agency has decided not to revise the standard's applicability in this respect.

The NHTSA also proposed exclusion of vehicles with the following characteristics: a speed attainable in 2 miles of not more than 45 mph, an unloaded vehicle weight that is not less than 95 percent of the vehicle GVWR, and no passenger-carrying capacity. Manufacturers of those vehicles generally supported the proposal but expressed confusion over each of the criteria. The largest question arose over the meaning of what constitutes the "unloaded vehicle weight." Crane Carrier, FMC Corporation, The Heavy Specialized Carriers Conference (HSCC), and Koehring pointed to the significant difference between the GVWR and the actual traveling weight of crane carrier models, considering special equipment which may or may not be included with the vehicle as optional or be permitted on the vehicle in transit.

The NHTSA has expressed the unloaded vehicle weight criterion in terms defined in § 571.3 of its regulations (49 CFR § 571.3) in a way which avoids these problems raised by the manufacturers. As defined, "unloaded vehicle weight" will normally be the GVWR of a vehicle minus its rated cargo load and its assigned occupant weight (at least 150 pounds). The rated cargo load would not include the weight of portions of a vehicle which are essential to its specialized



function whether or not they are removed in accordance with State regulation for transit purposes. To arrive at "unloaded vehicle weight," a manufacturer must only refer to the GVWR he has assigned to his vehicle, and subtract from it the rated cargo load he has assigned plus 150 pounds of each occupant position. These calculations are totally separate from the presence of particular optional equipment or necessary components which may or may not be removed for highway travel.

Manufacturers and the HSCC also asked whether occupant positions for crew members such as flagman or crane operator could be provided without constituting "passenger-carrying capacity." The NHTSA uses the word passenger in this context to mean a person who does not help to operate the vehicle or its equipment, *i.e.*, who is not part of an operating crew. Positions for the crew necessary to operate a vehicle's specialized equipment would not disqualify a vehicle under the passenger-carrying criterion.

Manufacturers recommended that the speed limitation of 45 mph be raised to 50 mph to allow unrestricted travel on all highway systems. The NHTSA remains convinced that this equipment with a high center of gravity and limited braking poses a safety problem when traveling at near highway speed in the flow of traffic. With the national speed limit at 55 mph, it is considered prudent to limit the speed of air-braked vehicles without 121 brake systems to a maximum attainable speed of 45 mph. For the benefit of the HSCC, it is noted that the definition of maximum attainable speed specifies a level surface for the basis of speed determination.

With regard to these vehicles, American-Coleman Company has requested that all vehicles equipped with a front steerable drive axle of 8,000 pounds GVWR or more be excluded from the requirements of Standard No. 121. The NHTSA has already fully considered this request, and in a series of notices (30 FR 40168, November 14, 1974; 40 FR 4153, January 28, 1975; 40 FR 8953, March 4, 1975), explained its reasons for not proposing such an exclusion. American-Coleman's petition is repetitious of its earlier petition and contains no new data for consideration. Accordingly, it is denied.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

*Effective date:* August 27, 1975. Because these amendments do not impose additional requirements on any person and because they must replace provisions effective September 1, 1975, it is found for good cause shown to be in the public interest that they become effective sooner than 30 days following publication in the *Federal Register*.

(Sec. 103, 119, Pub. L. 89-563, 30 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on August 15, 1975.

Robert L. Carter  
Acting Administrator

**40 F.R. 38160**  
**August 27, 1975**

# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 75-7; Notice 3)

This notice amends Standard No. 121, *Air Brake Systems*, 49 CFR 571.121, to permit bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvests to meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

This amendment follows reevaluation of a petition filed by Utility Trailer Manufacturing Company, in light of further data submitted by the company on August 6, 1975, and September 23, 1975 (these materials appear in NHTSA Docket No. 75-5). The NHTSA proposed to exclude certain specialized agricultural trailers from the emergency and parking brake requirements because "spring" brakes utilized for these systems were creating particular difficulty in harvest operations (40 FR 13316, March 26, 1975). Comments persuaded the agency not to proceed with the proposal at that time for two reasons (40 FR 28097, July 3, 1975). It appeared that control of air leakage and the installation of a manual parking brake control would permit disengagement in most cases, and that manual release and application would serve in the instances when all air had leaked away. The second reason to withdraw the proposal was that the excluded category was not defined well enough to limit the extent of the exclusion.

Utility has since supplied information indicating that air leakage cannot be controlled sufficiently to rely on it for the release of spring parking brakes under the specialized conditions of harvest operations. More significantly, Utility reports that inexperienced persons who mechanically release the spring brakes often fail to re-engage them for highway operation, permitting

the trailer to operate on the highway without a secondary means of braking.

With regard to the agency's concern that manufacturers supplying spring brakes to meet the standard would be placed at a competitive disadvantage by the exclusion, utility indicates that the manufacturers of the specialized trailers in question would approve of a parking and emergency braking system other than spring brakes. The competitive disadvantage would actually have occurred only with those highway trailers that were unintentionally included in the overly broad proposed definition.

With the newly submitted information in mind, the NHTSA has decided to issue the proposed exclusion, but in a more limited form than proposed. To limit the effect of this amendment to those trailers for which it is intended, the proposed definition is modified to describe more precisely trailers that are actually disconnected from highway truck-tractors and drawn through the fields as part of their function.

As discussed in the preamble to the proposal, the exclusion would have entirely excluded the trailers from the standard's emergency and parking brake requirements, relying on Bureau of Motor Carrier Safety Regulations to ensure the use of a "breakaway" system in their place. It is now apparent, however, that many of the vehicles in question would operate intrastate only, and that the breadth of the proposal must be somewhat restricted, to exclude only vehicles that are fitted with a breakaway system that complies with BMCS requirements.

In order to permit manufacturers of these specialized vehicles to commence manufacture for the 1976 harvest season, the NHTSA has decided to extend the duration of the limited exclusion

**Effective: December 5, 1975**

from the proposed date of January 1, 1976, to March 1, 1976. Utility requested that the date be extended to June 30, 1976, and the NHTSA will issue a further proposal if any further delay of this magnitude appears justified.

In consideration of the foregoing, S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) are amended. . . .

*Effective date:* December 5, 1975. Because this amendment does not place additional requirements on any person, and because manufacturers must be informed of future requirements for their products, it is found for good cause shown

that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on November 28, 1975.

James B. Gregory  
Administrator

**40 F.R. 56898  
December 5, 1975**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 75-16; Notice 6)

This notice amends Standard No. 121, *Air Brake Systems*, to suspend until January 1, 1977, the service brake stopping distance requirements as they apply to buses.

The NHTSA proposed a 1-year suspension of service brake stopping distances (40 FR 52856, November 13, 1975) following a public meeting on Standard No. 121 (49 CFR 571.121). Bus performance was reviewed by manufacturers and users, and by Rockwell International Corporation, presently the manufacturer of most of the axles and antilock components installed in transit and intercity buses. Other data collected by the NHTSA substantiate a pattern of erratic behavior in bus antilock equipment used in most transit and intercity operation that warrants disconnection while a correction is fully developed. The proposed suspension was based on manufacturer and user requests for a period in which modified hardware could be field-evaluated along with other antilock systems being offered for bus applications.

The comments uniformly supported the proposed suspension of service brake stopping distance requirements (including the "no lockup" requirement) for transit and intercity buses. However, component suppliers, bus manufacturers, and bus users differed over the extent of the proposal in three areas.

Rockwell and General Motors expressed concern that the preamble to the proposal had not made clear whether the proposal was intended to meet problems other than erratic antilock performance. Transport of New Jersey also objected that the proposal might be narrowly construed to mean that only the "no lockup" aspect of the stopping distance requirements would be suspended. AM General questioned whether the

revision included "any attempt to impose stopping distance and lane limit test requirements."

The NHTSA proposed suspension of the service brake stopping distance requirements (S5.3.1) in their entirety, not just the "no lockup" requirements of the section. Suspension of the entire requirement was intended to moderate the maintenance and misadjustment problems that are associated with the faster wearing brake linings provided in compliance with the standard.

General Motors noted that, because of the unique configuration of the braking system on its new transit bus, the limited nature of the NHTSA's proposed suspension, specifically the continuation of the partial system failure requirements, inadvertently prevents their bus from utilizing the lower-coefficient linings intended by the proposal. This issue is presently under consideration by the agency, and may be the subject of another proposal to be issued shortly.

The second area of concern to some manufacturers was whether the NHTSA intended to cover school buses with the proposed exclusion. General Motors and Wagner Electric Corporation expressed the view that school buses should not be included. International Harvester, Crown Coach, and several school districts believed that the vehicles should be included in the suspension. The NHTSA intended to include school buses in its proposal and, based on review of the comments, has concluded that these buses should be included in the suspension.

International Harvester pointed out that the stop-and-go cycle of school buses can cause distinctive stresses on the air brake system that are similar to that encountered in transit bus operation. While not made explicit, Crown Coach's comments illustrate that some school

buses utilize the same axles and antilock component as transit and intercity buses. Limiting the suspension to a portion of the air-braked school buses would create an unintended economic disadvantage for some school buses of this type.

Wagner and General Motors argued that some school buses utilize truck chassis and brake systems, and that these systems do not suffer from the same problems as the bus components criticized at the public meeting. It is true that the components utilized generally in trucks and also used in some buses have been determined to be reliable (40 FR 59222, December 22, 1975). The usage cycles of various vehicles are, however, evidently an important factor in some of the problems that have been experienced. Considering the similarity in the usage of school buses to that of transit buses, this agency has decided that the most desirable course of action is to include school buses in the suspension of stopping distance requirements.

The third area in which commenters questioned the extent of the proposal was the length of the suspension. Bus operators and their associations (*e.g.*, National Association of Motor Bus Owners (NAMBO), American Public Transit Association (APTA), Chicago Transit Authority) and bus manufacturers (General Motors, AM General, and Eagle International) generally argued that a 1-year evaluation period following development of adequate corrections to existing or new hardware would be necessary. Motor Coach Industries and Transportation Manufacturing Corporation (manufacturers of the majority of intercity buses) supported the 1-year proposal without commenting on the adequacy of the proposed 1-year suspension period. Rockwell, as the present manufacturer of most of the transit and intercity bus axles and antilock systems, cautioned the NHTSA that a specific date for the effectiveness of S5.3.1 would reduce the thoroughness of the evaluation program. The company did support the 1-year suspension.

The proposal was for a 1-year suspension only. This agency has not found this to be an emergency situation that would justify promulgating a delay greater than that proposed without the benefit of notice and opportunity to comment. Therefore, the NHTSA hereby makes final its proposed 1-year suspension of the stopping dis-

tance requirements, and will further evaluate the requests for a longer period of suspension. Bus manufacturers have stated that they intend to initiate field evaluation of improved antilock systems, and this agency will actively monitor these efforts as the basis for future action. The support of field testing by NAMBO and APTA will also be important in making meaningful evaluations of anticipated system modifications.

Chrysler, Freightliner, and International Harvester recommendations on other aspects of the standard and its applicability to other vehicle types have been responded to in the NHTSA's recent proposal for modification of the standard's performance levels for trucks, buses and trailers (40 FR 59222, December 22, 1975).

AM General asked whether buses manufactured during the suspension could be required to be retrofitted in the future. The answer is no. The motor vehicle safety standards in effect at any date apply according to their terms only to vehicles manufactured on that date. In answer to AM General's question whether the antilock system on 121-equipped buses may "be completely deactivated and dismantled and the vehicle returned to the pre-FMVSS #121 status," it is the position of the NHTSA that manufacturers and operators are the persons qualified and required to determine the safest configuration for operation of their vehicles, subject to applicable Bureau of Motor Carrier Safety regulations. With regard to the effect of Federal law on the modification of safety systems, a manufacturer of air-braked buses that conform to the air brake standard may instruct the owners of its products to disconnect the antilock system used to meet the standard, for the period necessary to correct a safety-related defect in the system that may make its operation hazardous.

It is also noted that this amendment constitutes the NHTSA's favorable response to APTA's October 6, 1975, request for modification of the standard, and the October 22, 1975, petition of the Eastern Bus Maintenance Men's Conference concerning Standard No. 121.

In consideration of the foregoing, S5.3.1 of Standard No. 121 (49 CFR 571.121) is amended by the addition of the phrase "Except for a bus manufactured before January 1, 1977, and" at the beginning of the first sentence.

Effective: January 6, 1976

*Effective date:* January 6, 1976. Because this amendment represents a relaxation of the requirements of the standard and does not place additional requirements on any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (14 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

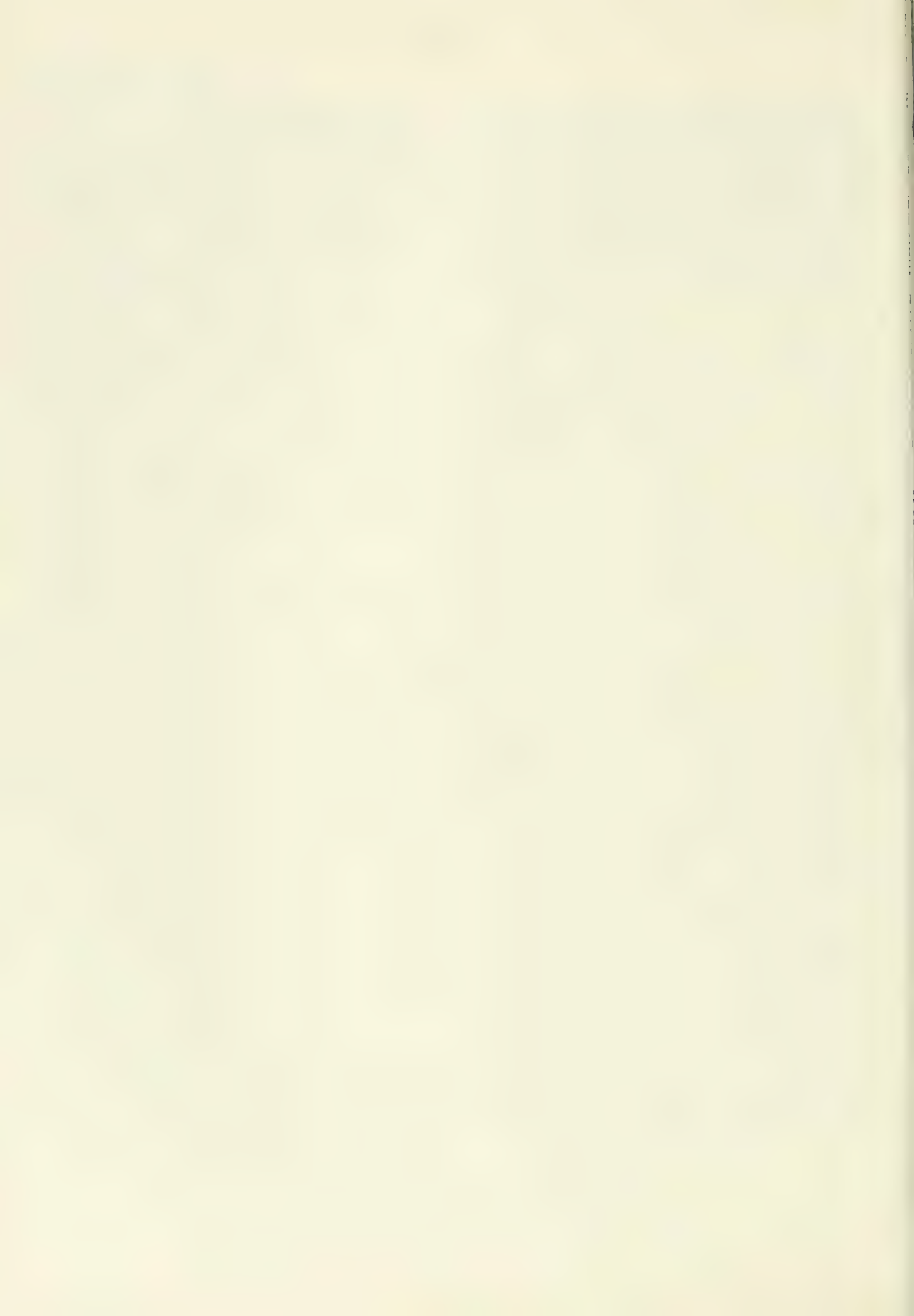
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Issued on January 6, 1976.

James B. Gregory  
Administrator

41 F.R. 1598  
January 9, 1976





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121**

(Docket No. 75-5; Notice 5)

**Air Brake Systems**

This notice amends Standard No. 121, *Air Brake Systems*, by extending until June 30, 1976, the period in which bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvest can meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

Standard No. 121, 49 CFR 571.121, presently permits this specialized agricultural trailer category the option, until March 1, 1976, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety requirements (49 CFR § 393.43). The NHTSA proposed extension of the March date to June 30, 1976 (41 FR 1763, January 12, 1976) to permit completion of the bulk agricultural commodity trailers necessary for the 1976 harvest season, in response to a petition of the Utility Trailer Manufacturing Company. In a separate action, the NHTSA has also proposed that the present parking brake requirements for all vehicles subject to the standard be broadened in a closely similar fashion to permit the use of an air energy source, with single diaphragm brake chambers as well as dual diaphragm brake chambers for actuation of the parking brake (40 FR 56920, December 5, 1975). It is clear, however, that separate and swifter action than the general proposal is necessary to permit the manufacture of trailers for the 1976 harvest.

Utility Trailer Manufacturing Company supported the extension of the period to June 30, 1976, and advocated extension of the option to all other air-braked vehicles. Wesco Truck and

Trailer Sales (Wesco) also supported the proposal and suggested that a 2-year suspension of the standard would permit perfection of the new brake systems. Wesco recommended that the parking brake system be made optional on this type of agricultural trailer. Fruehauf Corporation supported the proposal without qualification.

In view of the comments received and the NHTSA's continued view that the special considerations for in-field use should be given to agricultural trailers with regard to parking brake requirements, the agency has decided to amend the standard as proposed. The other recommendations by Utility and Wesco are noted, but they do not fall within the limits of action proposed by the NHTSA.

In consideration of the foregoing, the last sentences of paragraphs S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) are amended by changing the date "March 1, 1976" to "June 30, 1976."

*Effective date:* February 26, 1976. Because this amendment creates no additional requirements for any person, and because trailer manufacturers need to know the extent of the option period as the basis for planning manufacturing schedules, an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on February 20, 1976.

James B. Gregory  
Administrator

**41 F.R. 8347**  
**February 26, 1976**





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 75-16; Notice 7)

This notice amends Standard No. 121, *Air Brake Systems*, to establish brake performance levels that are less stringent than existing levels. The amendments also affect towing vehicle performance and the effective date of the standard for certain categories of specialized vehicles.

The National Highway Traffic Safety Administration (NHTSA) proposed these modifications (40 FR 59222, December 22, 1975) in response to information developed at an October 1975 public meeting and other information collected by the NHTSA on field experience with implementation of Standard No. 121 (49 CFR 571.121). The proposal also responded to requests from Freightliner Corporation, PACCAR Corporation, White Motor Corporation, and the American Trucking Association (ATA).

### CONSIDERATIONS UNDERLYING THE STANDARD

Under the National Traffic and Motor Vehicle Safety Act, as amended (the Act) (15 U.S.C. § 1381 *et seq.*), the Department of Transportation is responsible for the issuance of motor vehicle safety standards that, among other things, protect the public against unreasonable risk of accidents occurring as a result of the design, construction, or performance of motor vehicles. The Act directs the agency to consider whether a standard would contribute to carrying out the purposes of the Act and would be reasonable, practicable, and appropriate for a particular type of motor vehicle. 15 U.S.C. 1392(f)(3). The standard must, as formulated, be practicable, meet the need for motor vehicle safety, and be stated in objective terms. 15 U.S.C. 1392(a). The Senate Committee drafting the Statute stated that safety would be the overriding con-

sideration in the issuance of standards. S. Rep. No. 1301, 89th Cong., 2d Sess. (1966) at 6.

Vehicles equipped with air brakes figure prominently in the highway safety hazards addressed by the Act. The National Safety Council (NSC) reports that more than 700,000 air-braked vehicle accidents, causing over 5,000 deaths, occur each year. *Accident Facts* 56 (1975). Accident figures show that heavy truck-trailer combinations are extremely hazardous to other highway users, and have a disproportionate involvement in fatal accidents. *Accident Facts* 56 (1975). Not only is their exposure greater because of the higher average mileage traveled, but they actually have a much higher rate of fatal accidents *per vehicle mile*, as shown by the preliminary report in a recent study by the Highway Safety Research Institute. "Highway Safety Effects of Energy Crisis on U.S. Toll Roads" (NHTSA contract in process at Highway Safety Research Institute). The NSC reports that the rate of involvement per vehicle in fatal accidents by truck-trailer combinations is nine times greater than the involvement by passenger cars. The fatality rate of heavy truck-to-car accidents is fourteen times greater than that of car-to-car accidents. "Truck Accidents in North Carolina," *Highway Safety Highlights*, Highway Safety Research Center, U. of N. Carolina (May 1975). Approximately 35 occupants of passenger cars are killed for every occupant of a heavy truck who loses his life in truck collisions with passenger cars on the interstate system. *Truck Accidents and Highway Safety—An Overview* 6 (1968); National Transportation Safety Board, *Special Study, Commercial Motor Vehicle Braking* 2 (Nov. 1972). Indeed, there are some indications that the involvement rate in accidents by

truck-trailer combinations is increasing. "Highway Safety Effects of Energy Crisis on U.S. Toll Roads" (in process).

Faced with data showing the disproportionate hazards of heavy trucks on the highway, the National Highway Safety Bureau (predecessor agency to the NHTSA) initiated a program to improve the safety performance of these vehicles. There was no initial Federal motor vehicle safety standard applicable to air-braked trucks. At the inception of the regulatory development program, the agency solicited comments on several aspects of commercial vehicle safety (32 FR 14278, October 14, 1967) including brake systems, tires, and rear-underride protection. The engineering staff consulted with representatives of the heavy motor vehicle industry, reviewed existing data and literature, and issued several contracts to investigate the nature of the large vehicle safety problem. An advance notice of proposed rulemaking on coupled vehicle stability and control was issued in 1969 (34 FR 1055, January 23, 1969) to solicit the views of the industry and other interested parties on the means to reduce the number and severity of heavy vehicle accidents.

The determination of motor vehicle accident causation has been hampered by two basic difficulties. First is the absence of a representative broad-based body of highway accident data of sufficient detail to permit accurate discrimination of accident causation effects. Second is the undeveloped state of causation analysis methodology. Even if complete accident data were available, existing methodology provides no objective basis for quantitatively assessing the degree to which any prospective countermeasure would reduce the number or severity of crashes. The agency, therefore, had to rely on qualitative analysis, by its own and other researchers, of the limited available accident data on heavy vehicles.

Available evidence indicates that, relative to the lighter passenger cars sharing the highway, inferior braking and poor vehicle control of trucks during braking and turning maneuvers are substantial causes of heavy vehicle involvement in accidents. At the time the NHTSA first studied the problem, existing braking characteristics and performance of passenger cars and heavy trucks varied dramatically. Trucks gen-

erally are much heavier than passenger cars, have a higher center-of-gravity, and the axle-by-axle loads on trucks vary sharply between the loaded and unloaded conditions. *Bus, Truck, Tractor-Trailer Braking System Performance 1*, Highway Safety Research Institute, U. of Michigan (1971). Passenger cars' braking distances from 60 mph on a dry surface reported to NHTSA in 1975 by vehicle manufacturers range from 165 to 225 feet. *Brakes, a Comparison of Braking Performance for 1975 Passenger Cars and Motorcycles*. Truck-trailer combinations have average capabilities of approximately 300- to 350-foot stops under similar conditions, although some of the poorer-performing combinations take as much as 450 feet to stop from 60 mph. *Bus, Truck, Tractor-Trailer Braking System Performance*. Even the worst of these truck brake systems presumably met the only Federal braking requirements in effect at the time, those of the Bureau of Motor Carrier Safety (BMCS), which imposed requirements for stops from 20 mph. 49 CFR § 393.52.

Federal Highway Administration statistics demonstrate that, in rear-end collisions on the interstate system, vehicle types with the longest average stopping distances are also the vehicles with the highest rate of involvement in fatal accidents. *Public Roads 1969* Figure 9, and *Public Roads 1966* Figure 8. One study shows that, of 453 accidents involving one or more vehicles, more than three-fourths involved skidding, and loss of control occurred following application of the brakes in more than half of them. *The Importance of Loss of Directional Control in Car Accidents*, G. Grime (June 1963). NHTSA evaluation of BMCS statistics on selected major accidents of regulated carriers indicates that accidents involving "jackknifing" or other skidding, and collisions into the rear-end of vehicles, or into slowly moving or stopped vehicles, could often be reduced in severity or avoided altogether by improved vehicle stability and braking. This conclusion is supported by the National Transportation Safety Board, an independent agency that investigates major transportation accidents. *Special Study—Commercial Vehicle Braking 2* (November 1972). Independent researchers in State highway fatality statistics also conclude that improved braking



and handling for truck-trailer combinations would improve overall highway safety. Lohman and Waller, "Trucks: An Analysis of Accident Characteristics by Vehicle Weight," U. of N. Carolina (September 1975); Baker, Wong, and Masemore, "Fatal Tractor Trailer Crashes: Considerations in Setting Relevant Standards" (July 1965).

Numerous research studies have investigated the questions of improved stability of heavy motor vehicles, particularly truck-trailer combinations, *e.g.*, "The Handling and Stability of Articulated Vehicles under Braking Conditions," F. D. Hales, et al. (January 1966). It is a universally accepted principle of vehicle dynamics that a prerequisite to the maintenance of stability and directional control of any automotive vehicle is that its tires continue rolling. A tire on a locked wheel can generate no lateral forces to affect its direction of motion. A vehicle whose wheels are locked is likely to slide sideways as a result of such conditions as unevenness or banking in the road surface, wind forces, impacts on or by another vehicle or steering inputs by the driver as a result either of the emergency situation or of curves, *e.g.*, R.D. Lister, "Retention of Directional Control When Braking," SAE Paper 963A (January 1965); "Measurement of Vehicle Response in Severe Braking and Steering Maneuvers," Dugoff, et al., SAE Paper 710080 (January 1971).

Consultation with the truck manufacturing and user industry, and a major research contract on heavy vehicles for the agency, demonstrated that improved systems were available to increase heavy vehicle stopping control. *Truck, Bus, Tractor-Trailer Braking System Performance*, U. of Michigan (1971). Improved fade resistance, improved actuation and release times, greater air reservoir capacity, and partial failure performance are elements of such improved braking. Most important were more effective brakes to reduce the disparity in stopping capabilities between passenger cars and heavy vehicles, and provision against wheel lockup during braking in order to prevent the vehicle from skidding out of control. The ATA, in its comments on the 1967 notice concerning truck braking, recommended that consideration be given to "anti-locking brake devices." See NHTSA public

docket. Comments received in response to the agency's 1969 notice on coupled vehicle stability and control confirmed that better brake performance was possible and that various devices to reduce chances of wheel lockup were available. Meetings with an "outside task force" of interested industry representatives and with individual manufacturers also showed the technical feasibility of improved braking systems.

In view of the available technology to improve heavy vehicle braking and vehicle control, and the over-involvement of air-braked vehicles in highway crashes that could be avoided or reduced in severity by better braking and vehicle control systems, the NHTSB in 1970 proposed braking performance standards for air-braked trucks, buses, and trailers. The agency action was also motivated by the attempts to increase permissible size and weight of commercial vehicles on the interstate highway system (a weight increase to 80,000 pounds gross vehicle weight rating has occurred since proposal and implementation of the standard). Standard No. 121 was issued in February 1971, and was implemented for trailers on January 1, 1975, and for trucks and buses on March 1, 1975.

Although the standard involves numerous aspects of air brake systems, the most important and controversial provisions of the standard are those that require improved stopping capability and "no lockup" performance. Section S5.3.1 specifies stopping in limited distances from 20 and 60 mph, in the loaded and unloaded conditions on wet and dry surfaces, with the vehicle remaining in a 12-foot-wide lane and with limits on wheel lockup. It is the stopping limits and "no lockup" requirements that are the source of the basic issues concerning the standard.

The agency established a stopping distance requirement of 245 feet from 60 mph on a dry surface with the vehicle loaded. The stopping distance of passenger cars under comparable conditions averaged approximately 200 feet, with many vehicles bettering that mark. By mandating 245 feet as a minimum requirement, the standard improved the safety of air-braked vehicles in two ways. The minimum distance requirement placed a floor on stopping distance performance and eliminated the vehicles that



were built with extremely long stopping distances. More importantly, it mandated a substantial reduction in the disparity of braking performance between passenger cars and heavy vehicles as a whole.

While all elements of the industry supported the principle of minimum stopping distance requirements for air-braked vehicles, questions arose following issuance of the standard and before implementation as to the technological feasibility for mass-produced vehicles of the level set in the standard. The Act requires that safety standards be "practicable."

The basic NHTSA contract and other test data underlying the standard demonstrated that some pre-121 production vehicles already approximated the stopping distance requirement of 245 feet. But manufacturers that had stated they could provide the minimum stopping distance of 245 feet discovered that the traditionally weak front axle brakes on many trucks would have to be substantially upgraded, in some cases more than had originally been anticipated. Although the NHTSA implemented the standard with a 258-foot interim stopping distance to accommodate mass production start-up problems, front axle brakes on some vehicles were still overdesigned, and for two basic reasons. The source of the problem was not technological unfeasibility of producing the desired handling characteristics, which are available in many 121-equipped vehicles produced since March 1, 1975. Rather, it appears that some manufacturers sought to ensure 100-percent compliance with the standard by concentrating on utilizing a few new axle and brake assemblies that were sufficiently aggressive to manage the braking force for an entire line of vehicles. In addition, the unanticipated degree of variability in performance of some mass-produced components forced larger "compliance margins" of over-performance, to assure that each vehicle produced would meet the minimum performance level of the standard.

The NHTSA responded to the evidence of adverse handling in some manufacturers' production by increasing stopping distances to 277 feet until January 1, 1978 (40 FR 38160, August 27, 1975). This action was supported by manufacturers but failed to encourage sufficiently the "depowering" of front axle brakes. The agency

therefore proposed new established values (not limited to an interim period) in a proposal discussed in detail below.

Thus, while the stopping distances established by the standard have always been fully justified in safety need and technological feasibility, the agency has responded several times to evidence that some manufacturers were having difficulty in improving their worst-performing vehicles enough to satisfy the standard. The availability of mass-produced vehicles from some manufacturers that meet the 245-foot requirement without adverse handling (see Docket 75-16; Notice 02-125) demonstrates that the present proposed distance is undoubtedly achievable in advancing motor vehicle safety.

The other major provision that has raised issues in implementation of the standard is the requirement limiting lockup of wheels during the stops mandated by the standard. As explained earlier, the limitation on lockup is intended to increase the stability and directional control of heavy vehicles during braking and turning maneuvers. Most manufacturers utilize antilock systems to provide the required "no lockup" performance, although other devices (such as load-sensitive proportioning devices) may be capable of providing the specified performance. The systems are installed to momentarily and automatically release the brakes to avoid skidding in cases where the brake application is so strong, or the road surface so slippery, that wheel lockup would normally occur. Some manufacturers and users have reported that some of the antilock systems that have been installed do not function correctly and that malfunction makes 121-equipped vehicles less safe than pre-121 vehicles. These commenters argue that for this reason the standard does not meet the need for motor vehicle safety as specified in the Act.

Standard No. 121 meets the need for motor vehicle safety by specifying "no lockup" performance that increases directional stability and control of heavy motor vehicles to reduce their involvement in highway accidents. The decision by some manufacturers to choose a type of antilock that malfunctions or is not suited to their products does not mean that the standard fails to meet the need for motor vehicle safety. That conclusion could be drawn only if the safety

performance specified were not in fact practicable. The fact that thousands of vehicles have been manufactured with antilock systems that have not reported any safety-related defects clearly shows that the standard is practicable. The position that a manufacturer's failure to build a reliable product could of itself defeat the validity of a standard would place in the hands of the regulated industry the decision to implement, continue in effect, or cancel any safety standard.

The NHTSA has monitored the test programs of antilock manufacturers to ensure that reliable systems were introduced. Proprietary data on antilock test programs are included in the administrative record of this standard.

The NHTSA has taken appropriate action in the case of antilock malfunction that poses a potential safety hazard. In cases where the malfunction has momentarily released the brakes under some circumstances when they should remain applied, the agency has suspended the standard's requirements for a period to permit development of solutions to the design deficiencies involved (41 FR 1598, January 9, 1976). Most antilock malfunctions simply cause the system to disable itself and return braking to normal. Users have expressed the fear that, with disabled antilock, severe brake applications will cause wheel lockup and cause the vehicle to lose control and become a hazard on the highway. The NHTSA considers these fears unrealistic, because of the extremely limited cases in which the problem would arise.

The circumstance where a 121-equipped vehicle is significantly more likely to lock up than a pre-121 vehicle is on the front axle because of the generally stronger brakes. But the possibility of this occurring is prevented at low pedal applications by the provision of "automatic pressure limiting valves" that reduce or eliminate the brake pressure to the front axle during the great majority of brake applications. Also, a warning signal on the instrument panel advises of antilock electrical failure and gives advance notice to the driver in all cases except the statistically rare occasions when antilock fails during a panic brake application. In view of the benefit of functioning antilock and the extremely small chance that a driver would not be warned before

use of the brakes in a panic stop, the NHTSA evaluates the risk of malfunction as small and outweighed by the benefits of the antilock requirement.

Many commenters at the October 1975 public meeting suggested that hundreds of reliability problems with safety consequences have occurred in antilock components used to meet the standard. The Act requires vehicle and equipment manufacturers to report such safety-related defects that develop in their products, to the NHTSA and the agency has carefully monitored reports concerning antilock reliability. To date, only nine such safety-related defects have been reported, and the majority of them were limited to minor start-up problems in the mass-production process that were easily corrected.

#### NOTICE 05 PROPOSAL

Vehicles produced to meet the standard are now in service and available for comprehensive evaluation. Reports on vehicle performance were received at a public meeting on implementation of the standard in October 1975. Other reports have been made directly to the agency. The NHTSA has been testing 121-equipped vehicles at its Safety Research Laboratory since production vehicles have become available. In September 1975, the agency discussed implementation of the standard with all antilock manufacturers and several major vehicle manufacturers.

The NHTSA has determined that some vehicles produced to comply with the standard demonstrate unsatisfactory handling characteristics. The source of the problem is not technological unfeasibility of producing vehicles with desirable handling characteristics, as demonstrated by many of the 121-equipped vehicles produced since March 1, 1975. Rather (as noted earlier), it appears that some manufacturers sought to ensure 100-percent compliance with the standard by concentrating on utilizing a few new axle and brake assemblies that were sufficiently aggressive to manage the braking force for an entire line of vehicles. In addition, the unanticipated degree of variability in performance of some mass-produced components forced larger "compliance margins," to assure that each vehicle produced would meet the minimum performance level of the standard. The brake imbalance that



exists in any braking system (due to production variations) is of course magnified as the brakes become more effective.

While it would be possible to require redesign of the vehicles to eliminate these characteristics, the agency considers this course of action unduly costly in view of the economic situation of the heavy truck industry. Large sums have already been expended by vehicle manufacturers to achieve compliance with the standard. The agency has decided that it should instead reduce the performance levels of the standard somewhat to permit the "depowering" of the steering axle brakes sufficiently to improve handling characteristics while design problems are being resolved by the manufacturers.

The agency has evaluated the comments submitted by vehicle manufacturers and users, equipment suppliers, the International Brotherhood of Teamsters, and the Commonwealth of Pennsylvania. The NHTSA concludes that the proposal should be made final as proposed, with only a few modifications. While commenters expressed differing views on what other modifications of the standard might be beneficial to motor vehicle safety, they supported, with few exceptions, the proposed performance levels as a feasible technical level that would contribute to motor vehicle safety. A commonly expressed view was the need for stability in the performance levels of the standard as the basis to get the truck industry back into a healthy sales posture. Ford, for example, stated that it "trusts that the Administration will recognize the need to proceed cautiously to avoid further disruptions of the heavy truck business."

Because the comments generally agreed that the 293-foot stopping distance would accomplish the NHTSA's goal to permit depowering front axle brakes enough to eliminate handling problems, the stopping distance requirement is amended as proposed. Freightliner Corporation, which petitioned for these stopping distances, noted, "The proposed loaded vehicle stopping distances provide a realistic basis for establishing minimum service brake stopping distance requirements."

Oshkosh Truck Corporation disagreed with the proposed distances in the case of straight trucks,

with the view that the problems raised at the October 1975 public meeting apply only to buses and tractor-trailer combinations. Oshkosh pointed to the adequacy of its brake systems and noted that the earlier increase in permissible stopping distances from 245 feet to 277 feet should provide for any "compliance margin" for problems being experienced.

The NHTSA does not question the superior handling characteristics of Oshkosh vehicles, but acts from a concern over axle systems designed for the entire vehicle population, including many vehicles that are different from Oshkosh products. It is an unfortunate effect of reducing the requirements for all vehicles that manufacturers of the better-designed vehicles, such as Oshkosh, may feel forced by commercial considerations to downgrade the braking abilities of their products.

The Commonwealth of Pennsylvania, citing examples from its accident files of light vehicles being struck from the rear by heavy trucks, expressed strong concern over the proposal for an increased stopping distance. The NHTSA shares this concern. The countervailing considerations cited above lead to a reduction in the basic braking performance that has up to now been required by Standard 121. However, this agency has determined that the 293-foot minimum requirement, along with the many other requirements of the standard, will nevertheless substantially increase the braking capability of air-braked vehicles compared to that prevailing before the standard went into effect. The standards also continue to prevent the manufacture of those 3-axle trucks that have grossly inferior braking capability.

The International Brotherhood of Teamsters expressed continued support for the standard, urging more stringent performance levels in the future. As the proposal noted, far more information will be available in the future as the basis for further changes of the stopping distance performance levels, including the statistical evaluation of pre-121 and 121-equipped vehicles in the field. The NHTSA believes that further notice and the opportunity for comment should precede any future changes of the stopping distance requirements.

Vehicle manufacturers conducted as much testing as possible, during the winter months, of the



proposed new loaded-vehicle stopping distances. Most concluded that the unloaded stopping distance (258 feet versus 293 feet) would interfere with their efforts to "depower" braking sufficiently to reduce the possibility of adverse handling. The data on which the NHTSA based its proposal did not indicate that unloaded stopping distances would require relaxation in order to accomplish the desired depowering. Typically, unloaded performance is substantially superior to loaded performance and justifies shorter stopping distance requirements.

The ATA pointed out that as one braking characteristic is changed its effect on other characteristics is unpredictable. In this case, it appears that the recent testing demonstrates a sensitivity of unloaded to loaded stopping distance that has not been fully appreciated until now. To implement the NHTSA intention to permit sufficient "depowering" for improved vehicle performance, the agency concludes that the required unloaded stopping distance should be made equal to the loaded vehicle distances, as recommended by Ford, PACCAR, Freightliner Corporation, and Midland-Ross. Other manufacturers also stated that the shorter unloaded stopping distances could constitute a problem. The NHTSA considers it necessary, in light of this information, to increase the unloaded as well as loaded vehicle stopping distances. Table II is amended accordingly.

In view of this modification, the proposed exclusion of certain specialized vehicles from the unloaded stop (proposed S5.3.1.3) is unnecessary and therefore not adopted.

Wagner and some other commenters made the incorrect assumption that the NHTSA was concerned only with loaded-vehicle stopping performance of 121-equipped vehicles. While the agency's proposed action only addressed loaded distances, the express purpose was to permit "depowering" for improved handling under all conditions. Wagner's view that the NHTSA intended the use of antilock for unloaded vehicle stops is incorrect. Actually, the NHTSA anticipates that the depowering will have the effect of eliminating the need for antilock (or other mechanical means for preventing uncontrolled wheel lockup) under all conditions in the case of many vehicles.

Besides the many recommendations to specify comparable unloaded stopping distance requirements, commenters made varying suggestions for further change in stopping performance requirements. Consolidated Freightways called for deletion of the "antilock requirement" or, in the alternative, for cancellation of the standard. Its truck-manufacturing subsidiary (Freightliner Corporation) also called for prohibition of front axle brakes on three-axle truck-tractors. The ATA called for stopping distances that would guarantee deletion of front axle antilock. Mack Trucks, Inc., asked for deletion of the requirement for "no lockup" performance on the front axle. White Truck Corporation asked for longer distances in some cases. International Harvester asked for a 330-foot stopping distance, or a more fundamental revision of the standard proposed by the company in December 1974. Ford requested that one wheel be permitted uncontrolled lockup during stopping tests, and suggested further rulemaking to "remove the need for antilock on all front axles." Bendix Corporation suggested suspension of the service brake stopping distances and "no lockup" requirements for trucks.

The NHTSA judges that these requests are not directed at the "depowering" of overly effective brakes intended by the NHTSA proposal. For the most part, the recommendations appear to promote deletion of front axle antilock from certain trucks that may not allow a controlled "no lockup" stop without the system. Consolidated Freightways, Bendix, and Roadway Express argued for deletion of antilock from the entire vehicle. At least in the case of these three requests, the concern is apparently based on the continued argument as to the reliability of antilock. In the proposal underlying this rulemaking, the NHTSA explained the basis for its determination that antilock is reliable, and since that time the agency has not developed or had reported information which modifies that view. An additional safety-related defect report, involving potential radio frequency interference with antilock function in one vehicle manufacturer's products, has been reported, but no report of any accidents resulting from the defect has been made. The NHTSA maintains its conviction that antilock is sufficiently reliable to justify

its continued installation in satisfaction of the standard's requirements for directional stability. Accordingly, the agency does not act on the recommendations for deletion of the "no lockup" requirements or for distances calculated to eliminate the significance of the "no lockup" requirements. Consolidated's legal arguments on NHTSA rulemaking are being considered in the separate judicial review of Standard No. 121 and are not discussed in this notice for that reason.

Freightliner suggested relaxation of emergency braking distances, and PACCAR recommended that the 35-foot stop from 20 mph be made a 40-foot stop. The NHTSA did not propose these changes and does not believe them to be necessary for the "depowering" intended by the proposal. The 40-foot level would be no improvement over regulations existing prior to Standard No. 121. Furthermore, the agency gathers from the comments submitted that most elements of the industry desire certainty in the standards to return stability to the truck manufacturing process. In the interests of this certainty, the agency does not intend to further consider the Freightliner and PACCAR requests.

Along with the stopping distance modifications, the NHTSA proposed conforming changes in the dynamometer requirements. Brake fade and recovery levels would be reduced somewhat by the proposal, the "hot stop" requirement would be deleted, and recovery requirements for the front axle of truck-tractors would be deleted. These proposals were intended to permit "depowering" of brakes to the 293-foot stopping-distance level.

Rockwell International Corporation, a major supplier of foundation brakes and axle systems to the heavy vehicle industry, doubted that the dynamometer requirements would conform perfectly to the new vehicle stopping distance requirements. Rockwell estimated that 10 to 12 months might be required to accomplish adequate testing and reevaluation of brake sizes. The company suggested that all dynamometer requirements be suspended for an indefinite period.

The NHTSA did not propose such a broad revision of the standard and would have to propose such changes before they could be implemented. Furthermore, a suspension of requirements without certainty as to their status at an unknown future date would reintroduce an

element of uncertainty that Rockwell and many others cautioned against. For this reason, the modifications are implemented as proposed, and the NHTSA does not intend to act on Rockwell's recommendation.

No objections were received on the general reduction of brake fade and recovery performance and the air pressure values are amended as proposed. The ATA noted its support of the new values only if it permitted front axle brakes without antilock. Vehicle manufacturers generally stated that limited testing did not permit unqualified endorsement of the new values. The California Department of Highway Patrol (CHP) suggested that a change of deceleration rate would be more realistic than the proposed change of air pressure actuation. In response to the CHP concern, it is noted that the increase in air pressure was chosen as the means to revise requirements so that the years of data developed in the past could be used for calculations of the new values. The NHTSA agrees with the CHP that a reduced deceleration rate would be more realistic if it were a feasible choice.

The "hot stop" deletion was also supported, though most comments on the proposal stated that the whole section should be deleted and not simply the last sentence. The NHTSA purposely did not delete the whole section, so that the sequence of testing would remain as in the past, to preserve the data on recovery that was developed following "hot stop" testing. Therefore the required test level is deleted as proposed, but the testing remains in the standard to maintain the same sequence as in the past.

The deletion of recovery requirements on the front axle of truck-tractors was also supported, as it was discussed in the preamble. The proposed language incorrectly executed the NHTSA's intent as expressed in the preamble. With the necessary corrections, the proposals are made final as proposed. The CHP suggested an easing of "hot stop" requirements in place of deletion, but the agency does not consider it has a sufficient basis for the choice of new values, given the other reductions in dynamometer stopping distance values.

The agency proposed reduction of retardation force requirements in the case of trailers to maintain balance with the longer distances permitted



for trucks. The modifications were supported, although K-B Axle Company qualified its support by noting that conforming linings might not be available immediately. The company suggested suspension of trailer retardation requirements. The NHTSA does not consider this suggestion meritorious, because it would leave no assurance of continued compatibility between the truck and trailer.

Based on further testing, Rockwell supplemented its original comments with a request for somewhat lower trailer retardation force levels than the 0.43 value proposed. The company justified a 0.40 value, based on variability experienced in the new testing. A second manufacturer of trailer axles (Eaton Corporation) supported a 0.40 value in meetings with the NHTSA. The new retardation values are therefore implemented as proposed although at slightly lower values. In response to the CHP question concerning the need for numbering columns, these designations are necessary so that any future revision can be easily noted with precision.

The NHTSA proposed reduction of parking brake performance levels for vehicles that operate in combination, so that the vehicles, taken together, would produce approximately the same holding power as single-unit vehicles. Although petitioners PACCAR and Freightliner asked for reduction of grade-holding levels for all vehicles (and repeated these requests in their comments), the NHTSA rationale for the proposal was to accomplish the far more limited purpose of reducing the cost and weight of 121-type parking brake systems on high-mileage tandem-axle vehicles that operate in combination.

As proposed, however, the proposal applied to towed and towing vehicles with a single non-steerable axle as well as those equipped with tandem-axle assemblies. It is obvious that the desired cost and weight reduction intended in the proposal (typically removal of one set of spring brakes from one axle) cannot be achieved on a vehicle with only one non-steerable axle. At the same time, the proposal would permit less powerful parking brakes on this vehicle category. The CHP pointed out that these single non-steerable-axle vehicles are commonly operated in doubles operation, when parking brakes become more

important in view of the total combination grade-holding ability. The NHTSA concludes that the proposal in the case of vehicles with single non-steerable axles will not accomplish the intent of the proposal and is therefore withdrawn.

It also became apparent that the proposed reduction in parking brake retardation force for tandem-axle trailers could not be justified. The proposed change from a 0.28 value to a 0.23 value was calculated on the basis of the share of a full load that the typical trailer should hold in combination with a truck-tractor to equal the performance of single-unit vehicles. No petitions were received requesting the modification, but possible weight and cost reductions were considered possible. Fruehauf Corporation supported the proposal, while the Truck Trailer Manufacturers Association stated that cost savings were unlikely from the proposed change.

Unlike trucks and buses, trailers utilize the parking brake system as an emergency braking capability, in case of trailer "breakaway" or other failure of the service brake system. This parking brake system and emergency capability utilize the service brake friction elements and are thus directly dependent on the effectiveness of the service brakes. In view of the NHTSA decision to reduce trailer service brake effectiveness somewhat more than proposed, the agency considers that the vehicle's emergency braking capability would be reduced too much by a commensurate reduction of parking brake requirements. Therefore the parking brake proposal for trailers is withdrawn.

As for the tandem-axle truck-tractors for which the proposal was intended, it appears that the NHTSA estimate of a 0.17 retardation value was somewhat too high to accomplish the proposal's intent. PACCAR made several objections to any specification beyond that necessary to hold on a 15-percent grade. The company's testing showed that variability in materials and other factors required a 0.148 value in place of 0.17. Freightliner recommended a 0.16 value. White Motor asked for a .15 value and Rockwell recommended a .13 value. International Harvester supported the modification as proposed. NHTSA evaluation of submitted data indicates that a small decrease in the value from 0.17 to 0.14 is necessary to permit the intended deletion of



parking brake actuation mechanisms. Accordingly, the parking brake option of S5.6.1 is amended to reduce the retardation forces for tandem-axle truck-tractors.

The CHP made extensive and detailed comments on the parking brake proposal which have been evaluated by the NHTSA. The CHP submission assumed that only one non-steerable axle on buses and single-unit trucks would be equipped with parking brakes. This assumption apparently arose from a rearrangement of the wording of S5.6.1 that resulted in moving the phrase "on any axle other than a front steerable axle" in one subsection of the proposed modification. All other commenters understood the rearrangement and based their comments on the requirements as they have always existed for buses and single unit trucks.

In response to a petition from the ATA, the agency proposed a 0.20-second limit on minimum brake actuation timing of towing vehicles. The ATA asserted that the compatibility of towed and towing vehicles would be improved by a limit on minimum actuation speeds as well as the minimum actuation timing already specified. Responses on the proposal by the manufacturers of brake components and of air-braked vehicles generally opposed the imposition of minimum actuation times. Of the manufacturers that commented, Rockwell supported the proposal without stating its rationale, and PACCAR and Freightliner stated qualified support for a minimum value, if the limit on maximum actuation times was raised or eliminated. The CHP supported the proposal, although its engineering calculations were not expressed.

From the comments submitted, the NHTSA concludes that a minimum actuation time is an insufficient means to assure compatibility, and that further study of adequate means is advisable. Midland-Ross Corporation reminded the agency and industry that trailer response time is a separate but important portion of the problem. International Harvester argued that a limit on minimum actuation time might inhibit other modifications to improve compatibility. For these reasons, the proposal to impose minimum actuation times is withdrawn.

Manufacturers indicated that the 0.40 maximum actuation time was discouraging the slower

actuation time desired by the ATA. The agency concludes that the ATA request can in part be met by an increase in permissible actuation time in place of the requested limitation on minimum actuation times. For this reason, the maximum permissible actuation time for trucks and buses is modified to 0.45 seconds from 0.40 seconds (S5.3.3).

The delayed effective dates for certain categories of specialized vehicles were also addressed by the proposal. In view of the uncertainty introduced by the proposal regarding the performance levels, the agency considered it necessary to delay the effectiveness of the standard further for these vehicle classes.

Reaction to this proposal in the case of fire-fighting vehicles (delay from March 1, 1976, to September 1, 1977) was not uniform. The Fire Apparatus Manufacturers Division of the Truck Body and Equipment Association supported the delay because custom vehicles utilize Rockwell antilock systems similar to those utilized on some buses. In the cases of buses, a major provision of the standard was suspended for a 1-year period to permit resolution of certain problems in the antilock system. Several small manufacturers also supported the delay. Other manufacturers indicated their readiness to meet the standard and asked that it not be delayed. Oshkosh has been building 121-equipped vehicles for some time and stated its reliance on the March 1, 1976, date as the basis for preparations to commence production of the new systems in fire trucks by March 1976. American-LaFrance, a large manufacturer of fire fighting vehicles, also requested implementation of the standard as scheduled for fire fighting vehicles.

In view of the statements of readiness by fire fighting vehicle manufacturers, the NHTSA has concluded that the standard should be implemented as soon as possible. The Rockwell antilock system on trucks has not evidenced reliability problems like those on buses that would justify a suspension of the requirements that underlie their use. However, the NHTSA proposal has justifiably permitted manufacturers to modify their plans and readiness, and the agency concludes that a short delay is necessary to allow preparations for the standard's implementation. Accordingly, the effective date for fire fighting

vehicles is delayed from March 1, 1976, to June 1, 1976.

The Heavy Specialized Carriers Conference of the ATA, Fruehauf Corporation, the Truck Trailer Manufacturers Association, and Birmingham Manufacturing Company all supported the proposed delay until September 1, 1977, of the standard's applicability to heavy hauler trailers. No objections were received on the proposed delay for auto transporters and vehicles with a gross axle weight rating (GAWR) for any axle of 24,000 pounds or more, or two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle. White Motor Corporation supported these delays as the minimum necessary, and supported a similar delay of the standard's full requirements for certain vehicles listed in S5.3.1.2. In view of the comments, the delays are made final as proposed.

The CHP expressed concern that other large and specialized vehicle categories are permanently excluded from the standard. The CHP anticipates that, in the absence of Federal requirements, a number of State regulations could be developed, some of which might be inadequate to ensure safety. The NHTSA is sympathetic to the concern, but at this time, considers it unwise to initiate the suggested rulemaking. Large axle and brake suppliers like Rockwell are absorbed in making calculations for the changes already proposed, and any further changes should await more deliberate and thorough review when more time is available. It is noted that American-Coleman has filed a petition for the exclusion of more vehicles from the standard. Until these conflicting requests are resolved, the CHP correctly notes that the States may continue to enforce their regulations against these vehicles.

With regard to heavy vehicles, the CHP asked for a clarification of the limits on what constitutes the "rated cargo load" in the NHTSA definition of "unloaded vehicle weight." The NHTSA permits the rated cargo load and the gross vehicle weight rating to be determined by the manufacturer. If the CHP believes it has a better means of making that determination, its suggestion will be considered when received.

Certain test procedures were questioned by commenters. Wagner asked for confirmation

that unloaded truck-tractor tests do not include the use of an empty control trailer. Wagner is correct. Mack and Roadway Express suggested that unloaded vehicle tests should be run with the empty control trailer attached. This modification has not been proposed and will not be acted on. With the increased unloaded vehicle stopping distance requirements, the NHTSA finds that the generally longer "bobtail" truck-tractor stopping distances should not interfere with adequate "depowering" of overly effective brakes.

For testing, the NHTSA proposed that the control trailer braking capabilities remain at the same level as in the past, instead of being reduced to conform to the proposed longer stopping distance requirements of S5.3.1. As Wagner recognized, this proposal was intended to permit the continued usefulness of past test data in making new calculations of necessary towing vehicle capabilities. Wagner, Bendix, and the ATA warned that the values will no longer be representative of equivalent production trailer stopping capabilities. Vehicle manufacturers supported the continued use of the existing control trailer performance. The NHTSA concludes that, although the control trailer will be somewhat less realistic than is normally desirable, this consideration is outweighed by the importance of maintaining the usefulness of the large amount of data already developed in the years of preparing for implementation of the standard. Therefore the control trailer specification remains as it has in the past.

The CHP requested that certain abbreviations in the standard be made uniform, and Wagner suggested that the standard be published in its entirety. The NHTSA anticipates these actions at the time of the next codification.

The ATA questioned the statement that European braking practice differs from the traditional practice in the United States of weak front brakes. In response, the NHTSA notes the recent Commission of European Communities directive for improved vehicle capability specified a higher retardation ratio for the front axle of commercial vehicles than on the rear axle.

The Truck Equipment and Body Distributors Association did not state its position on the pro-

**Effective: February 26, 1976**

posals made, but indicated that the requirements of the standard as a whole present too great a burden on the association's membership. This issue is being litigated in the suit for review of the standard and, for this reason, is not discussed in this notice.

In light of the foregoing, amendments are made in Standard No. 121, *Air Brake Systems*, 49 CFR 571.121 . . . .

*Effective date:* February 26, 1976. Because these amendments effect the relaxation of requirements and create no additional burden upon any person it is found for good cause shown that

an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on February 26, 1976.

James B. Gregory  
Administrator

**41 F.R. 8783**  
**March 1, 1976**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket Nos. 75-7; 75-16; Notices 3 &amp; 9)

This notice republishes in their entirety Standard No. 105-75, *Hydraulic Brake Systems*, and Standard No. 121, *Air Brake Systems*, because the number and complexity of recent amendments to these standards may have created confusion for some interested persons.

Standard No. 105-75 (49 CFR 571.105-75) was issued September 1972 (37 FR 17970, September 2, 1972) and has been amended numerous times since issuance. Although an up-to-date and complete text of the standard appears each year in the republished Code of Federal Regulations, several complex amendments have been made to the standard in the past year that are not reflected in the most recent up-to-date text. To assist interested persons who must be certain of the text's provisions, the agency herewith publishes the standard in its entirety. Interested persons are advised that amendments of Standard No. 105-75 may occur in the future, although no proposals are outstanding at this time.

In a related matter, General Motors Corporation has brought to the agency's attention an inadvertent deletion of one sentence from one section of Standard No. 105-75. A statement was added to the text of S5.1.5.2(a)(2) to permit an interim increase in permissible control force for the fifth wet recovery stop (40 FR 24525, June 9, 1975). Inadvertently, this sentence was deleted from S5.1.5.2(a)(2) in a subsequent rulemaking action (40 FR 42872, September 17, 1975), although the preamble to the notice made clear that "The new wording in no way modifies the meaning of S5.1.4(a)(2) and S5.1.5.2(a)(2)." To correct this omission, the sentence appears in this publication. It has been moved to S5.1.5.2(a)(1) because it concerns the maximum pedal force limit in that section, rather than the minimum pedal force limit in S5.1.5.2(a)(2) where it appeared in the past.

Standard No. 121 (49 CFR 571.121) was issued in February 1971 (36 FR 3817, February 27, 1971) and has also been amended numerous times since issuance. Several amendments have occurred since the most recent publication of the standard in its entirety. For the reasons cited with regard to Standard No. 105-75, the agency herewith publishes the standard in its entirety. Interested persons are advised that three proposals to amend the standard are outstanding (40 FR 45200, October 1, 1975) (40 FR 56920, December 5, 1975) (41 FR 20706, May 20, 1976) and that amendments to the text of the standard may be made in the future.

It has also been noted that a clarification could be made to the language of S3 of the standard that excludes until September 1, 1977, vehicles that combine with other vehicles to form auto transporters. The temporary exclusion was added to the standard in January 1975 (40 FR 1246, January 7, 1975). To make the effect of that action more clear the language in the second sentence of the text "or to any vehicle which" is changed in this republication to read "or that." This modification of the language has no effect on the requirements of this standard and notice and opportunity to comment are therefore found to be unnecessary.

In consideration of the foregoing, Standard No. 105-75 (49 CFR 571.105-75) and Standard No. 121 (49 CFR 571.121) are republished . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on June 30, 1976.

Robert L. Carter  
Associate Administrator  
Motor Vehicle Programs

41 F.R. 29696  
July 19, 1976



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 75-5; Notice 7)

This notice amends Standard No. 121, *Air Brake Systems*, to extend until June 30, 1977, the period in which bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvest can meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

Standard No. 121 (49 CFR 571.121) permitted this specialized agricultural trailer category the option, until June 30, 1976, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety requirements (49 CFR 393.43). The National Highway Traffic Safety Administration established the June 30, 1976, date (41 FR 8347, February 26, 1976) to permit completion of the bulk agricultural commodity trailers necessary for the 1976 harvest season.

Titan Trailer Corporation petitioned for a year's extension of the option because the reasons cited by the agency for the option still exist, and the company plans to manufacture the specialized vehicles throughout the year.

The agency does not wish to limit the manufacture of these trailers to only one of the available systems. In fact, the agency has an outstanding proposal to broaden the available means to meet the parking and emergency brake requirements for all trailers in a closely similar fashion to the bulk agricultural trailer option (40 FR 56920, December 5, 1975). Because of the comprehensive nature of that proposed revision, it will not be acted on in the immediate future. The NHTSA concluded that the option should be extended for a period to permit the continued manufacture of these trailers as they

have been manufactured. The extension was proposed July 6, 1976 (41 FR 27740).

Comments were received from Utility Trailer Manufacturing Company, Fruehauf Corporation, and Wesco Truck and Trailer Sales. All comments supported the proposal, and it is made final as proposed.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of the proposal on the public and private sectors, including possible loss of safety benefits. Because the option simply permits continued manufacture of these trailers in the same fashion as they have been manufactured to date, and because the possibility for misuse of the mechanical parking brakes appears to be great in this case, the agency concludes that there would be no new economic or environmental costs imposed by the action, and that there would be no significant loss of safety benefit in this case.

In consideration of the foregoing, the last sentence in paragraph S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) is amended by changing the date "June 30, 1976" to "June 30, 1977."

*Effective date:* September 24, 1976.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on September 22, 1976.

John W. Snow  
Administrator

41 F.R. 43153  
September 30, 1976





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 75-16; Notice 10)

This notice amends Standard No. 121, *Air Brake Systems*, to extend from January 1, 1977, to September 1, 1977, the existing suspension of service brake stopping distance requirements as they apply to buses. Editorial changes are also made.

Equipment used in transit and intercity buses to conform to the stopping distance requirements (S5.3.1) of Standard No. 121 (49 CFR 571.121) demonstrated a pattern of erratic behavior following implementation of the standard for buses on March 1, 1975. For this reason, the agency suspended these stopping distance requirements (including the "no lockup" requirement) to provide a period in which modified antilock hardware and newly introduced systems could be field-evaluated (41 FR 1598, January 6, 1976). Based on a petition for a longer suspension and on the agency's conclusion that the experience of a full year of antilock operation in all environmental conditions would be necessary to generate and analyze adequate data to make a sound decision in time to permit orderly planning of bus production, a further suspension to September 1, 1977, was proposed (41 FR 20706, May 20, 1976).

Comments were received from vehicle manufacturers and users, and from the two antilock system manufacturers that provide components for transit and intercity bus antilock systems. The National Motor Vehicle Safety Advisory Council did not take a position on the proposal. The Vehicle Equipment Safety Commission did not comment on the proposal. Interested persons are advised that Docket Nos. 74-10 and 75-5 are related to the subject of air brake system requirements.

The comments generally supported the proposed extension, and no commenter opposed the

additional eight months for evaluation. AM General Corporation and Crown Coach requested that the suspension be extended to January 1, 1978, but did not provide data that would substantiate the need for additional time. Freightliner Corporation, Rockwell International, and the American Public Transit Association (APTA) recommended that the stopping distance requirements for buses be indefinitely suspended until justification for them is articulated, analysis of their "costs and other consequences" is set forth under Department of Transportation (DOT) policies (41 FR 16200, April 16, 1976), and extensive antilock system tests and evaluation have been completed.

The requests by Freightliner, Rockwell, and APTA demonstrate a possible misunderstanding of the regulatory action under consideration, and the agency therefore takes the opportunity to put it in perspective. The stopping distance requirements of Standard No. 121 are in place for buses, and the only modification in the standard being considered is an extension of the temporary suspension of those requirements. Thus, if the agency takes no further action, the stopping distance requirements resume on January 1, 1977. The agency's favorable action on the September 1, 1977, date only means that the stopping distance requirements resume September 1, 1977. No regulatory action to modify the requirements themselves is contemplated, and therefore no "impact evaluation" of these requirements would be appropriate under the DOT policies cited by APTA.

Concern has been voiced that the agency set forth its rationale for specifying stopping distance requirements (including "no lockup" performance) in the case of buses. Several

commenters appear to be under the impression that Standard No. 121 is directed solely to the elimination of jackknifing by truck-trailer combination vehicles. In fact the standard applies to air-braked straight trucks and buses because of the evidence that these vehicles are also involved in accidents due to vehicle instability and inadequate braking capabilities.

Jackknifing is only one severe result of the lateral instability caused by loss of traction due to locked wheels during braking. The same instability can also lead to sliding, "spin-out," and loss of steering capability in straight trucks and buses. The need for protection against such problems has been specifically addressed several times in earlier notices on the standard (e.g., 35 FR 10368, June 25, 1970; 39 FR 44480, December 24, 1974; 40 FR 24915, June 11, 1975; 41 FR 8783, March 1, 1976). Rockwell asked that further analysis be provided that would be directed specifically at the accident experience of buses. The company suggested NHTSA analysis of the recent Bureau of Motor Carrier Safety Report on "1973/74 Accidents of Motor Carriers of Passengers" and the data supporting the report. That report has been reviewed by the NHTSA, along with the individual bus accidents reports for 1975.

The report itself (available in the NHTSA docket and from BMCS) emphasizes highway, driver, and time and place aspects of the accidents without detailing information that would indicate accident causation. The individual accident reports, however, contain more complete information. Review and tabulation of information contained in the written descriptions of accidents provides the following facts:

1. In the year 1975, 750 bus accidents resulting in fatality, injury or a minimum of \$2,000 in property damage were reported to BMCS.
2. Of the total, 322 (43 percent) were described in a way that indicates that braking occurred prior to the accident. Sixty-eight (9.1 percent) of the accidents were explicitly described as involving skidding due to locked wheels during braking. The 68 skidding accidents resulted in 6 fatalities, 296 injuries, and an average of \$5,213 property damage per accident.
3. No antilock-equipped bus was involved in any of these skidding accidents.

The NHTSA does not claim that all of these accidents would have been prevented if the buses had been equipped with antilock systems. The accident descriptions are not detailed enough to estimate the effect of "no lockup" capability. But the evidence demonstrates that skidding accidents are common for buses, and it is reasonable to assume that a significant portion of those accidents could have been prevented or lessened in severity by no-lockup braking capability.

Claims by transit bus operators that transit buses should be excluded from the "no lockup" requirement because of their low-speed urban operation are not substantiated by the BMCS data. Although most of the buses subject to BMCS regulation are of the intercity type, the accidents involving skidding are seldom high-speed accidents. For those cases in which vehicle speed prior to the accident was reported, it averaged only 36 mph. Furthermore, approximately half of the skidding accidents occurred in residential or business areas. These conditions are typical of transit bus operation, and the NHTSA concludes that transit buses should be subject to minimum requirements for lateral stability and service brake stopping capabilities.

The issue at hand is whether the existing suspension of certain of the standard's requirements should be extended to September 1, 1977, to permit the accumulation of more test data on the suitability of modified and new antilock systems designed for buses. As noted earlier, erratic behavior of previous bus antilock designs formed the basis for the existing suspension. Recently, a manufacturer of cab-chassis for school buses has also reported a safety-related defect installation in some school buses.

On May 12, 1976, Rockwell submitted to the agency a proposed test program for its bus antilock system. The program called for 39 intercity and 85 transit buses to be equipped with the modified Rockwell system. Rockwell estimated an accumulation of more than 9.6 million axle miles of service by August 1, 1976. By August 20, 1976, Rockwell had equipped 27 intercity and 37 transit buses with revised components for testing. The number of test vehicles is less than originally planned, partly because of lack of cooperation by operators and State inspection officials, and partly because of Rockwell's decision



to withhold further installation of test units until the agency makes final the 8-month extension. By August 20, 27 inoperative occurrences had been reported in 1.4 million axle miles of transit bus operation. Rockwell did not report results of intercity bus operations, but Motor Coach Industries (a manufacturer of intercity buses) reported 16 inoperative occurrences in approximately 1.8 million axle miles of intercity service with the Rockwell system.

In its May 12 letter, Rockwell also announced a parallel experimental testing program for a new antilock system design. To date, only one of these units has been placed in transit system service, and it has accumulated over 20,000 miles without difficulty.

The AC Division of General Motors has also been testing an antilock system for buses. As of October 26, AC had installed its antilock system in 10 transit buses and 11 intercity buses. An additional 13 transit bus installations are planned in the near future. The transit buses range from zero to three months of service, with no problems encountered. Motor Coach Industries reported one inoperative occurrence in the six AC installations they have made, with an accumulated mileage of approximately 0.8 million axle miles. The other five AC-equipped intercity buses have experienced no problems after about one month of service.

AC Division indicated in its comments on the proposal that, barring any unforeseen difficulties, production AC antilock systems will be available for buses manufactured on and after January 1, 1977. As of the date of this notice, AC Division has not notified the NHTSA of the development of any "unforeseen difficulties." Based on this information and analysis of the reliability data furnished to date, the agency has decided to amend Standard No. 121 as proposed to extend the suspension of bus stopping distance requirements to September 1, 1977. The preliminary data indicate that a reliable antilock system will be available in time for reinstatement of the requirements, and a further delay is not contemplated.

An issue related to this decision on bus stopping distance requirements was raised in the comments to the proposal. Rohr Industries and

International Harvester requested that the suspension of stopping distance (and "no lockup") requirements be made "retroactive" to buses manufactured since the effective date of Standard No. 121 but prior to the January 6, 1976, commencement of the suspension.

The statutory and regulatory scheme under which the standard was promulgated do not provide for such "retroactive" action. Section 108 (a)(1)(A) specifies that a vehicle shall comply with standards in effect on the date of its manufacture. Part 571 of NHTSA regulations also state: "... each standard set forth in [Part 571] applies according to its terms to all motor vehicle or items of motor vehicle equipment the manufacture of which is completed on or after the effective date of the standard" (49 CFR 571.7). In this case, antilock systems have been disconnected because of safety-related defects in their operation. Under § 154 of the Act, the vehicle manufacturer must provide an adequate repair of safety-related defects, unless replacement of the vehicle, or refund of the purchase price, is undertaken. "Adequate repair" is defined in § 159(4) not to include "any repair which results in substantially impaired operation of a motor vehicle or item or replacement." The permanent disconnection of an antilock system would be considered by the NHTSA to constitute substantial impairment of the motor vehicle. Of course, the vehicle owner is entitled to decline an offer of repair by the manufacturer.

In a matter unrelated to the proposal, the agency takes the opportunity to make several editorial changes to the text of Standard No. 121. A correction in S5.1.7 ("statically" in place of "statistically"), conformance of the auto-transporter effective date in S5.3 to the correct date in S3 (September 1, 1977), and deletion of an obsolete reference to S5.3.1.3 in S5.3.1 are all effectuated. Additionally, options that terminated in June and September 1976 are deleted to simplify the standard's text.

In accordance with Department of Transportation policy encouraging adequate analysis of the cost and other consequences of regulatory actions (41 FR 16200, April 16, 1976), the NHTSA has evaluated the economic and other consequences of this amendment on the public and private

**Effective: November 26, 1976**

sectors, including possible loss of safety benefits. The agency estimates that there will be a cost to society due to the delay, because of the decreased stability of buses produced without "no lockup" capability. However, the potential for accidents due to possible malfunction of the new antilock components exists in the absence of the longer suspension. Also, there are costs associated with the increased maintenance that could result from reintroduction of antilock systems earlier than September 1, 1977.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended . . . .

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*Effective date:* November 26, 1976.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 19, 1976.

John W. Snow  
Administrator

**41 F.R. 52055**  
**November 26, 1976**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 75-16; Notice 12)

In response to two petitions for reconsideration of earlier rulemaking and to related requests, the NHTSA has extended for four months the existing suspension of the bus service brake stopping distance requirements contained in Standard No. 121, *Air Brake Systems*, along with an additional 3-month extension for school buses. A manufacturer of intercity buses and a manufacturer of school bus chassis petitioned to extend the suspension, which was scheduled to end September 1, 1977. The delay in reaching a decision on the petitions has made a short extension desirable.

*Effective date:* June 13, 1977.

For further information contact:

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### BACKGROUND

Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Following implementation of the requirements for buses, a pattern of erratic behavior developed in the performance of the antilock system used by manufacturers of transit and intercity buses to satisfy the "no lockup" requirements of the standard (S5.3.1). At an October 1975 public meeting the bus operators and manufacturers involved reviewed their experiences with implementation of the standard and expressed their

views on potential safety hazards of antilock malfunction. Based on these and other reports, the NHTSA proposed a suspension of the service brake stopping distance requirements (including the "no lockup" requirement) to provide a period in which modified antilock hardware and newly introduced systems could be field-evaluated (40 FR 52856; November 13, 1975). The proposed suspension of 1 year until January 1, 1977, was made final January 6, 1976 (41 FR 1598; January 9, 1976). Several vehicle manufacturers and user groups argued that the suspension should be for a longer period and the suspension was subsequently extended from January 1, 1977, to September 1, 1977 (41 FR 52055; November 26, 1976).

### PETITIONS AND REQUESTS FOR DELAY

Motor Coach Industries (MCI) and its parent company Greyhound Corporation have asked that the termination of the suspension for service brake requirements be delayed until January 1, 1979, in the case of intercity buses. The American Public Transit Association (APTA) also petitioned for the same delay in the case of both intercity and transit buses. The Chicago Transit Authority (CTA) recommended complete exclusion of transit buses from the standard, although the arguments in their letter only address the "no lockup" requirement, and the CTA may have meant to request exclusion from this requirement only.

Transit and intercity buses use a distinctive axle configuration, and only one supplier of antilock components for the axle exists. The supplier, AC Division of General Motors, has indicated its readiness to supply antilock components to transit and intercity bus manufactur-



ers (and those school bus manufacturers that utilize the same distinctive axle).

International Harvester (IH) petitioned for reconsideration of the September 1977 termination date for stopping distance requirements in the case of air-braked school buses, arguing that reliability testing of new sensor and mounting components would require continuation of the suspension until mid-April 1978. IH had reported a safety-related defect in its school bus antilock system in July 1976 due to vibration-induced "false cycling" problems associated with the school bus duty cycle. While IH and its antilock supplier are not experiencing reliability problems with the new antilock component used on school bus chassis, the company wishes to accumulate at least 6 months of field evaluation before going into production. IH and Kelsey-Hayes (its antilock supplier) met with the NHTSA engineering staff on February 17, 1977, to provide information on the field evaluation. That meeting was followed by additional meetings and a detailed letter request to Kelsey-Hayes for further durability testing data.

This notice also responds to a recommendation on the bus suspension from the Truck and Bus Safety Subcommittees of the National Motor Vehicle Safety Advisory Council and the National Highway Safety Advisory Committee. These subcommittees were established by the Secretary of Transportation to provide recommendations on truck and bus safety. At the request of former NHTSA Administrator John Snow, the subcommittees convened in March 1977 to address the issue of Standard No. 121's implementation. From that meeting, the subcommittees recommended, among other things, continuation of the suspension of service brake requirements for buses until January 1, 1979. The American Trucking Association (ATA) has since petitioned the NHTSA to adopt this and related recommendations of the subcommittees.

#### EVALUATION OF THE PETITIONS

While most of the petitions, requests, and recommendations were not accompanied by supporting information, the MCI and IH petitions included data on reliability testing to support their requests. Data on the AC Division system used on intercity, transit, and some school buses

was evaluated separately from the data on the Kelsey-Hayes system used by IH on its school bus chassis.

*Intercity and Transit Buses.* When the bus service brake stopping distance suspension was proposed in November 1975, AC Division indicated that it would enter the intercity and transit bus antilock market, and MCI agreed to have one of its intercity buses equipped with AC equipment. MCI equipped a second bus with AC equipment on an experimental basis and subsequently installed four more systems on a production line basis in 1976.

The 1-year suspension was made final in January 1976. In May 1976 the agency proposed continuation of the suspension to September 1977 "to have the experience of a full year of antilock operation in all environmental conditions, particularly in the winter season" and to permit reaching "a sound decision in time to permit orderly planning of bus production."

In making final the 8-month extension in November 1976 the agency noted AC Division's test experience with bus antilock systems (including data on MCI buses) and AC's position that it expected to have antilock ready as production hardware by January 1, 1977. The NHTSA therefore notified the public that "The preliminary data indicate that a reliable antilock system will be available in time for reinstatement of the requirements and a further delay is not contemplated" (41 FR 52057; November 26, 1976). In a February 1977 meeting with the NHTSA, AC Division indicated that it has production hardware ready on a 4-month leadtime basis, and that General Motors is prepared to equip its own production of intercity, transit, and school buses with its product starting September 1, 1977.

AC Division field-evaluated its system on GMC buses (both intercity and transit), on Flxible transit buses, on one Prevost intercity bus, and on MCI intercity buses. AC reported to the NHTSA on 34 installations, of which six were MCI buses. Data were reported on the MCI buses both for an early generation of components and for a later set. Second generation computers were supplied so that common computers with a new diagnostic feature could be used on trucks and buses. Prototypes of second

generation sensors were provided to account for bus brake temperatures that are higher than those of trucks, and to prevent water intrusion in the new design.

In analyzing reported malfunctions on the MCI buses, the agency eliminated three "burned out" computer failures that occurred while the bus was in the shop and were caused by a mechanic's negligence that permitted a "severe load dump" to the electrical system. A malfunction caused by improper bearing adjustment was also eliminated. As of April 25, 1977, 5 malfunctions had occurred during 2.8 million axle miles of travel (187,000 vehicle miles per failure). The malfunctions were "fail safe" and all occurred before the corrections discussed above. Mileage since the corrections produced no malfunctions.

The AC Division bus antilock system is essentially the same as AC truck systems that have proved reliable in service since their introduction in early 1975. While the agency does not dispute MCI's view of what level of testing it considers appropriate, the NHTSA has confirmation by General Motors, as a manufacturer of both intercity and transit buses, that they are confident of the AC Division system and are prepared to place it on their vehicles.

At the same time, the second generation sensor is entering production at this time for installation on trucks, and production units will be available for further evaluation in the more demanding bus application. In view of this opportunity for evaluation of redesigned sensors built on production tooling, and in view of the agency's delay in responding to the petitions for reconsideration, it is concluded that a short continuation of the suspension until January 1, 1978, is justified. Accordingly, on reconsideration of the September 1, 1977, termination date established last November, the NHTSA hereby extends the suspension to January 1, 1978, for transit and intercity buses.

The CTA asked for total exclusion of transit buses from the standard but addressed only the issue of antilock system reliability. APTA petitioned for continuation of the suspension for both transit and intercity buses, although the association's arguments addressed only transit buses. APTA reviewed experience with the

Rockwell system that had developed problems in early 121-equipped buses, cited the subcommittees' recommendation for further delay, and recommended the initiation of a 6-month 200-vehicle fleet test prior to implementing the service brake stopping distance requirements.

The NHTSA has analyzed the two petitions and does not believe that they provide additional information that would justify a delay beyond January 1, 1978, for these buses. The CTA did not provide data that would substantiate its assertions that radio frequency interference (RFI) is a problem, or that transit buses do not require "no lockup" performance. The NHTSA believes the references to RFI refer to the past system used on buses. AC Division has detailed the precautions it has taken against RFI, and it has had field experience with its system on trucks for more than 2 years. The safety need for "no lockup" performance on transit buses was discussed by the NHTSA in the November 1976 notice cited earlier, and the agency maintains its view of the desirability of this safety feature.

The majority of APTA's comment addressed the Rockwell system that is no longer in use. The only comment about the AC Division system pointed out the introduction of the second generation sensor in June 1977 and concluded that a 200-bus fleet test of the antilock components would be desirable. The NHTSA has explained above why it considers a 4-month delay adequate to be assured of reliability of this component. As to the size of the test fleet, it is the agency's view that the APTA membership could have tested 200 units on its transit bus fleets during the past 18 months if it had cared to. The agency is not aware of APTA objections to the size of the AC Division test effort at the time it was constituted as a 34-bus fleet.

*School buses.* In the case of air-braked school buses, a comparable situation has arisen to that of intercity and transit buses. Second generation componentry for IH buses has been introduced by Kelsey-Hayes, no reliability problems have been encountered, and the subcommittees also recommended continuation of the suspension. While the same considerations argue for a 4-month delay, the agency does not have as many miles of field data on the newly designed sensor



and mounting bracket upon which to make a judgment of system reliability as it did in the case of the AC Division system and its new sensor. In addition, most school buses receive little or no use during the summer months. For this reason the NHTSA concludes that the full period of delay requested by IH in its petition for reconsideration should be allowed. In this period, approximately 100 new sensor installations will be monitored to provide full assurance of system reliability. Accordingly, 3 additional months of suspension have been provided in the case of school buses only.

### TRUCK AND BUS SAFETY SUBCOMMITTEES

The NHTSA Administrator invited the subcommittee's Chairman to hear a presentation of NHTSA findings on the issue of continued suspension for buses. That invitation was expanded to include those members of the subcommittees that wished to accompany the Chairman to the April 22, 1977, briefing. Although not planned as a meeting of the subcommittees, a summary of the meeting has been prepared for submission to the public docket.

The subcommittees heard the agency's views and offered their own. The agency weighed the points made by the subcommittees in support of a delay until January 1, 1979, but concluded that adequate field-testing time would be available to make preparations for meeting the full requirements of Standard No. 121 by January 1, 1978, in the case of transit and intercity buses, and by April 1, 1978, in the case of school buses. The American Trucking Associations had petitioned the NHTSA to follow the subcommittees' recommendation of a January 1, 1979, effective date for buses and other enumerated vehicles. To the degree that this decision does not grant the American Trucking Associations' petition relative to buses, it is denied for the reasons set forth above. Other items in the ATA petition will be treated in subsequent notices.

At the meeting the agency expressed its view that it is incumbent on a manufacturer asking for more test time to explain why its test programs had not been enlarged to proportions that would give adequate assurance of reliability by

the scheduled termination date. Opportunities to expand the test program in this case existed in November 1976 when the agency stated it contemplated no further delay and again in January 1977 when Rockwell withdrew as a supplier of antilock systems. The agency urged expansion of test programs when requests for further delay were received. Contacted about the size of its test fleet, MCI indicated that the test fleet was kept small in the first instance so that it could be carefully monitored to avoid accidents. Only after some confidence in the safety of the new components is accumulated will MCI expand its programs to a larger number of buses.

The agency knows that it cannot and should not design a manufacturer's test program. At the same time, the agency cannot be prevented from carrying out its safety mission simply by the decision of a manufacturer not to undertake design and testing of safety systems proposed by the agency. It is obvious from the legislative history of the National Traffic and Motor Vehicle Safety Act that Congress intended the manufacturers to be responsive to the agency's proposals for upgrading safety systems.

While the agency has not adopted completely the recommendation of the subcommittees in the case of buses, their recommendations have formed the basis of several significant actions by the Department of Transportation. Noteworthy in this regard is the decision by the Federal Highway Administration's Bureau of Motor Carrier Safety (BMCS) to commence "courtesy inspections" of 121-equipped vehicles later this year. In the near term, these courtesy inspections are for informational, educational, and training purposes, and are intended to form the basis for future BMCS compliance inspections.

In consideration of the foregoing, the phrase "Except for a bus manufactured before September 1, 1977" in S5.3.1 of Standard No. 121 (49 CFR 571.121) is amended to read "Except for a school bus manufactured before April 1, 1978, or any other type of bus manufactured before January 1, 1978."

The economic and inflationary impacts of this rulemaking have been evaluated in accordance with Office of Management and Budget Circular



A-107, and an Economic Impact Statement is not required.

Because the amendment delays requirements that would otherwise become effective and does not create additional obligations for any person, the agency finds that the amendment may become effective immediately.

The program official and lawyer principally responsible for this rulemaking are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 7, 1977.

Joan Claybrook  
Administrator

**42 F.R. 30188**  
**June 13, 1977**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 75-16; Notice 15)

This amendment adds a small number of vehicles to the category of oversize and specialized vehicles that are permanently excluded from the applicability of Standard No. 121, *Air Brake Systems*, extends the existing temporary exclusion of heavy hauler trailers and auto transporters until January 1, 1979, and eliminates the "no lockup" requirement in the case of trailers designed exclusively for harvesting lumber or pulpwood, and in the case of inboard wheels on trailers with more than four wheels on an axle system. The amendment responds to manufacturer petitions for exclusion from some or all of the requirements of the standard because of the vehicles' distinctive configurations and functions.

Effective date: August 22, 1977.

Addresses: Petitions for reconsiderations should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

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Office of Crash Avoidance  
National Highway Traffic Safety  
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Supplementary Information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers, and has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Certain vehicles were excluded from the standard's applicability because their functions or construction dictate oversize or dis-

tinctive operational characteristics that result in restricted highway operation (e.g., low speed, permit requirements, daytime operation), which limits hazards and the possibility of accidents. Also their distinctive configurations and low production volumes increase compliance costs.

Because of unavailability of components and other constraints, certain other vehicle categories were excluded from all or some of the standard's requirements for a temporary period. The temporary exclusions that remain in effect are scheduled to end on September 1, 1977.

Several vehicle manufacturers and trade associations petitioned for extension of some of the temporary exclusions, or conversion of them into permanent exclusions. The Truck and Bus Safety Subcommittees of the National Motor Vehicle Safety Advisory Council and National Highway Safety Advisory Committee recommended to the Secretary of Transportation that particular vehicle types be granted full or partial exclusions from the standard.

Based on consideration of the petitions and on the recommendations of the Truck and Bus Safety Subcommittees, the NHTSA proposed several new permanent exclusions from the standard. The 108-inch-width exclusion was proposed for expansion to include vehicles with a width of more than 102 inches. In all states other than Hawaii, vehicles of this width are allowed on the highway only in permit operation. The agency finds that these vehicles are operated with the same level of care as vehicles of 108 inches in overall width. No adverse comment was received on the proposal and it is accordingly made final.



The agency proposed permanent exclusion of vehicles whose gross vehicle weight rating (GVWR) exceeds 120,000 pounds, under the assumption that such vehicles always operate under restrictions of state motor vehicle administrations. Comments were solicited on whether such vehicles exist that are not already excluded from the standard under another category, and whether such vehicles ever operate in unrestricted highway use. Fruehauf, Rogers Brothers, and Talbert Trailers pointed out that Michigan allows unrestricted highway operation of certain trailers in excess of 120,000 lbs. GVWR. These trailers may be flatbeds, tankers, or dump bodies with 8 or more axles and are currently being built to conform to the standard. Low bed heavy hauler trailers, on the other hand, must have their axles aft of the load, and do not have room for as many as eight axles without exceeding the state length limit requirements, and hence are still subject to restricted operation. It is apparent that the exclusion should be narrowed so that its language reaches only those vehicles originally intended for exclusion. It appears that only low bed "heavy hauler" trailers in this weight range fall under state operating restrictions. As made final, therefore, the exclusion is narrowed to cover only a trailer that has a GVWR of more than 120,000 pounds and a body that conforms to the height limitation for heavy hauler trailers of 40 inches. Fruehauf suggested a 44-inch deck height criterion, but offered no supporting information, and the NHTSA sees no reason to change from the 40 inches presently specified for heavy hauler trailers.

The third proposed permanent exclusion was for "load divider" dollies that are designed exclusively for use with the larger trailers that are already excluded from all the requirements of the standard. This addition was supported, but the Truck Trailer Manufacturers Association (TTMA) and others requested a correction in the description of the vehicle. The agency referred to the "fifth wheel plate" of the dolly which improperly described the connecting or mating devices employed. The proposal is made final, with an appropriately broader statement of vehicle description.

Several commenters argued for additional permanent exclusions from the standard. Schwartz Manufacturing Company asserted that the "heavy hauler" trailers that are currently excluded from the standard for a limited period should all be permanently excluded because of their off-highway use and their typical ownership by a small company with limited maintenance resources. The agency has proposed and is making final an extension of the existing temporary exclusion while it develops more data on the difficulty encountered by manufacturers in constructing these vehicles to comply with the standard. Information requests have been issued by the agency and replies have been received which are presently undergoing analysis. Until analysis is completed, it would be premature to act on the Schwartz request, and it is therefore declined.

Master Truck, the City of San Diego, and the Lake Disposal Corporation supported the Truck and Bus Safety Subcommittees' suggestion to exclude refuse trucks from Standard No. 121 entirely, or at least from the "no lockup" provision. The commenters pointed out that the duty cycle of these vehicles differs from that for highway tractor-trailer combinations and that much of the travel is at low speeds between pick-ups. The City of San Diego pointed out that it must purchase from the low bidder, which can result in having to service several of the commercially available antilock systems, thereby compounding maintenance problems. The agency does not dispute these points, but also does not view them as peculiar to the brake systems of these vehicles. Refuse collection and hauling presumably do put distinctive strains on a vehicle, and the problem of low-bid contracting does occur in municipal fleet maintenance. It is assumed that such problems with braking and other vehicle systems occurred prior to implementation of Standard No. 121 and that adaptive steps were taken to compensate for them. It is conceivable, in fact, that some of the adaptations (such as the use of longer wearing but less effective brake linings) may have reduced somewhat the braking capability of some refuse haulers in relation to vehicles of comparable size that serve other functions. It is the agency's considered

judgment that the duty cycle of a particular vehicle type should not be fully determinative of its braking capability or general safety characteristics. For this reason, the agency declines to act on requests for exclusion of these vehicles but will continue to give consideration to this and other proposed adjustments in the standard's applicability.

Zieman Manufacturing Company asked that trailers with a GVWR of 10,000 pounds or less with air-over-hydraulic brakes be excluded from the standard's applicability. Such an exclusion was proposed in June 1975 (40 FR 24915, June 11, 1975) in response to the petition of Altec Industries. On the basis of comments received, particularly those of the California Highway Patrol, it was decided not to provide such an exclusion because of the potential for abuse of the category. The Zieman request is therefore not adopted.

No comment was received from any mobile crane manufacturer on the wisdom of continuing the present limits for these vehicles: exclusion of larger categories only, unless top speed is restricted to 45 mph. In the absence of comment, the agency has decided to leave the present exclusions affecting mobile cranes unchanged, except for the over 102-inch width exclusion previously discussed.

It is noted that the existing permanent exclusion of non-cargo-carrying trailers was inadvertently restated in the proposal in exactly the opposite form from that intended. The error is corrected in this amendment.

As a general matter, the continuation of temporary exclusions for heavy hauler trailers and auto transporters was supported. Little information was provided in the comments on the readiness of manufacturers to implement the standard by January 1, 1979. Information requests have been sent to the affected manufacturers to develop additional data. Freightliner Corporation, as the manufacturer of incomplete truck tractors for auto transporter combinations, argued for the indefinite exclusion of these combinations from the standard.

Freightliner's first argument was that the high center-of-gravity characteristics of the towing vehicle (car carried over the cab) and the unique load transfer characteristics of the articulation point on some auto transporters can produce effects which combine to offset the advantages of imposition of the standard on these vehicles. The agency understands that these factors can make compliance for auto transporters more difficult, and has acknowledged this fact by proposing an effective date for auto transporters that is four years after the initial effective date for other highway vehicles. However, the agency is also aware that auto transporters can be (and have been) built to comply fully with the present requirements of the standard. If Freightliner or any other interested party has data to show that the present requirements are insufficient to ensure a safe braking system for auto transporters, the agency solicits their suggestions for improvements.

As a practical matter, the agency has stated (May 5, 1975, NHTSA letter to E. Hammond, Trailmobile Tech. Center) that it will use the chassis manufacturer's load limitations, both weight and center-of-gravity, for purposes of determining compliance. Thus Freightliner's "envelope" of specifications in its incomplete vehicle document would be the outside limit for loading the completed tractor for compliance test purposes. The only limitation on this method would be an "envelope" of specifications so conservative that the braking characteristics of the vehicle as completed would constitute a safety-related defect.

The second point raised by Freightliner is that the testing procedures in the standard may need to be modified before tractors and trailers of the auto transporter combination can be tested separately. During the period of continued delay, the NHTSA intends to call a public meeting to discuss this problem with the affected chassis-cab manufacturers and the auto transporter industry. Freightliner's suggestion for indefinite delay appears unnecessary and, accordingly, is declined.



Freightliner's third argument was that, assuming that incompatibility between the tractor and trailer portions of an auto transporter is great, the agency should not require their compliance with the standard until all incompatibility is removed from all air-braked vehicle combinations subject to the standard. Actually, the compatibility problems between tractor and trailer are probably less in the case of auto transporters than other combinations because there is more pairing of tractors and trailers in this industry than in the case of dry freight vans. The NHTSA tests mentioned by Freightliner will be completed prior to the January 1, 1979, effective date for auto transporters.

PACCAR, Inc., and Mack Trucks, Inc., both commented favorably on the American Trucking Association's request to continue the exclusion of vehicles equipped with an axle with a gross axle weight rating (GAWR) of 24,000 pounds or more. The agency did not propose continuation because no vehicle or axle manufacturer had petitioned for delay, and because there was strong evidence that the exclusion was being abused by manufacturers who would provide a higher-than-normal rating to avoid the requirements of the standard. PACCAR's expectation that few such vehicles are built because permits are required for loads of more than 24,000 pounds on an axle is not to the point. It is not the gross vehicle weight on the highway that is controlling here, but simply the capacity of the axle installed by the manufacturer. In other words, the vehicle could obtain complete exclusion by the installation of heavy axles, whether or not they are ever used on the highway at full capacity requiring permit operation.

Mack noted the many truck types (*e.g.*, cement mixers, dump trucks) whose permits, if any, do not closely control the actual operation of the vehicle. As a practical matter, these vehicles operate in unrestricted operation with extremely heavy, and often high center-of-gravity, loads that necessitate extremely good braking. The agency continues to believe that an exclusion at this GAWR level is unjustified. The 29,000-pound exclusion reflects the larger vehicles with truly distinctive configuration and more specialized operation that justify special treatment.

Mack, PACCAR, and the ATA also recommended extension of the exclusion for vehicles with two or more steerable axles with a GAWR of 16,000 pounds or more for each axle. No supporting data was presented and no other comments were received. In the absence of any supporting data the request is denied.

The partial exclusion from the "no lockup" requirement in the case of "wheels other than the outermost on an axle system with more than four wheels" was supported without comment and is therefore made final. Rogers Brothers suggested that use of "axle system" to describe the row of wheels across the vehicle could be misleading. The agency's use of the term as part of its certification requirement to state "axle system" GAWR has not proved troublesome. On the basis of this experience, the terminology is made final as proposed.

The TTMA suggested that the exclusion of certain logging and pulpwood trailers from the "no lockup" requirement be expanded to permit them the same parking brake option as is provided to agricultural commodity trailers. While not within the scope of this notice, the agency will consider this suggestion in its next parking brake proposal.

While the Truck and Bus Safety Subcommittees did not take a position on the proposal, it is noted that their June 23, 1977, letter to Secretary Adams reaffirmed their earlier recommendations for revision of Standard No. 121.

The economic impact of this rule has been considered and has been determined to be minimal. This is due primarily to the low production volume both collectively and by individual firms and the brief leadtime remaining to make considerable design changes. This could even cause substantial adverse economic and financial impacts if these manufacturers were forced to comply by the September 1, 1977, effective date. However, it has also been determined that the additional leadtime provided by this Final Rule should be sufficient to modify production lines which would incorporate the necessary design changes to accommodate the FMVSS 121 hardware.



**Effective: August 22, 1977**

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective date finding. Because these amendments relieve a restriction and do not create additional responsibilities for any person, it is found that an immediate effective date that advises manufacturers of the new requirements as soon as possible is in the public interest.

The program official and lawyer principally responsible for this rulemaking document are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on August 16, 1977.

Howard Dugoff  
Acting Administrator

**42 F.R. 42208**  
**August 22, 1977**



## PREAMBLE TO AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems

(Docket No. 75-16; Notice 14)

The amendment extends indefinitely an existing option for specialized agricultural trailers under Standard No. 121, *Air Brake Systems*, of meeting the parking brake requirements of the standard or the air-actuated "breakaway" requirements of the Bureau of Motor Carrier Safety. The option exists because the working environment of the trailers can lead to disabling of the parking brakes, and a solution to the underlying technical problems has not been perfected.

Date: Effective date June 27, 1977.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

#### For Further Information Contact:

Scott Shadle  
Office of Crash Avoidance  
National Highway Traffic Safety  
Administration  
Washington, D.C. 20590 (202) 426-0852

Supplementary Information: Standard No. 121 (49 CFR 571.121) permitted some bulk agricultural commodity trailers the option, until June 30, 1977, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) (S5.6.3) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety (BMCS) requirements (49 CFR 393.43). Most manufacturers use the stored energy of a compressed spring to apply and maintain the required braking force required by S5.6.3.

Manufacturers petitioned for modification of this parking brake requirement in the case of some agricultural trailers because they often are

dropped off near the fields by highway tractors and then towed into the fields by farm tractors. The farm tractors do not have air compressors to recharge the air supply and release the brakes in order to move the vehicles. When the spring brakes are mechanically released to allow movement they may not be re-engaged for highway operation, permitting the trailer to operate on the highway without a secondary means of braking. To avoid the hazard of on-highway operation with disengaged spring brakes, the agency adopted the option for a limited period.

Wesco Truck and Trailer Sales petitioned for extension of the option to December 31, 1978, and Utility Trailer Manufacturing Company petitioned for its indefinite continuation. The agency has an outstanding proposal to broaden the available means to meet the parking and emergency brake requirements for all trailers (40 FR 56920; December 5, 1975). However, because of the comprehensive nature of the proposed revision, it will not be acted on in the immediate future.

Until the broad proposal is made final or until another solution is available, the agency decided that the exclusion for these specialized trailers from the parking and emergency braking requirement should continue, as long as the vehicles are manufactured to comply with the BMCS requirements noted earlier. Accordingly, the agency proposed that the temporary exclusion contained in S5.6 and S5.8 of the standard be made permanent.

All comments received on the proposal supported continuation of the option. In the absence of a satisfactory solution to the underlying technical problems, the agency has decided to make final the changes as proposed.



In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

The economic and inflationary impacts of this rulemaking have been evaluated in accordance with OMB Circular A-107, and an Economic Impact Statement is not required.

The agency finds that this amendment may become effective immediately, because the continuation of the option relieves a restriction.

The program official and lawyer principally responsible for the development of this amend-

ment are Scott Shadle and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 27, 1977.

Joan Claybrook  
Administrator

**42 FR 33293**  
**June 30, 1977**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121****(Docket No. 75-16; Notice 18)**

This amendment suspends the school bus service brake stopping distance requirements of Standard No. 121, Air Brake Systems, which were scheduled for reimplementation April 1, 1978. This action is taken to preserve the status quo of the standard's applicability while more far-reaching issues of the air brake standard are resolved by the Department.

Dates: The amendment is effective March 23, 1978. Petitions for reconsideration must be received no later than April 24, 1978.

For further information contact:

Mr. Duane Perrin, Crash Avoidance Division, Office of Vehicle Safety Standards, 400 Seventh Street, SW., Washington, D.C. 20590 (202-426-2153).

Supplementary information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Following implementation of the requirements for buses, a pattern of erratic behavior developed in the performance of the antilock system used by manufacturers of transit and intercity buses to satisfy the "no lockup" requirements of the standard (S5.3.1). The NHTSA suspended the service brake stopping distance requirement (including the "no lockup" requirement) for all buses to provide a period in which modified antilock hardware and newly-introduced systems could be field-evaluated (41 F.R. 1598; January 9, 1976). Several vehicle manufacturers and user groups argued that the suspension should be for a longer period and the suspension was extended from January 1, 1977, to September 1, 1977 (41 F.R. 52055; November 26, 1976), and subsequently to January 1, 1978 (42 F.R. 30188; June 13, 1977), with an additional 3-month delay for school buses.

The suspension of requirements for school buses is therefore scheduled to end April 1, 1978. While no school bus chassis or final-stage manufacturer has petitioned for further delay of the "no lockup" requirement, two petitions for the exclusion of school buses from this requirement have been submitted by the users of school buses. The National Association for Pupil Transportation petitioned for permanent exclusion of school buses on several grounds, including assertions about the unreliability, high costs, and difficulty of maintaining antilock systems.

A second petition was recently filed jointly by the Transportation Director's Association of the State of Georgia, the County Superintendents of the State of Georgia, and the State Specification Committee of the State of Georgia. This petition requests exclusion of school buses from the entire standard, although the arguments for exclusion relate mainly to antilock system difficulties.

Much of the information in both petitions appears to be based on experience with systems manufactured during the first months of the standard's implementation, and does not take into account improvements and other changes in circumstances since the bus service brake stopping distances were suspended in January 1976. Most notably, the extension of stopping distance requirements in March 1976 (41 F.R. 8783; March 1, 1976) permits most school buses to be certified to S5.3.1 of the standard without the installation of antilock systems. Current manufacturer plans are for antilock to be standard equipment on about 18 percent of all school buses after the scheduled reimplementation of service brake stopping distance requirements. Approximately 85 percent of these buses would have antilock only on the rear axle.

The Department has initiated a series of actions that are intended to resolve major concerns that have been raised with regard to the reliability,

effectiveness, and costs of the antilock systems generally used to meet the standard (42 F.R. 9626; March 9, 1978). Given this initiative, it appears inappropriate to change the status quo as it affects the manufacturer of vehicles not presently required to meet the stopping distance and "no lockup" requirements of S5.3.1. While there appears to be no independent basis in data or individual experience to indicate that the requirements should not be reimplemented for school buses at this point, manufacturers that otherwise support the standard have counseled maintenance of the status quo for school buses while the other more major issues are resolved. This point was made in December 1977 by Ford as a major supplier of school bus chassis and by Bendix, a manufacturer of antilock systems.

The NHTSA has therefore decided to temporarily postpone reimplementations of the service brake stopping distance requirements of Standard No. 121 as they apply to air-braked school buses. The NHTSA solicits comment on the reestablishment of these requirements at a certain date and on what that date should be. The Motor Vehicle and Schoolbus Safety Amendments of 1974 (Pub. L. 93-492, October 27, 1974) and mail regularly received by the agency make clear that the public and their legislators advocate strong regulation of the safety systems on school buses.

In accordance with Departmental procedures, the economic and other consequences of this rule-making have been evaluated. As the rule maintains the status quo, it is not expected to have any new effects other than the inventory losses for the

several school bus chassis manufacturers which do not also build trucks. These inventories could be utilized in response to purchase of antilock systems on an optional basis.

In an unrelated matter, the agency takes this opportunity to delete S3.1.2 and the reference to it in S3.1, because it was a temporary provision of the standard that is no longer effective.

Effective date finding: It is found that notice and public comment on this amendment are impracticable because of the extremely short time remaining before the requirement in question would otherwise become effective (April 1, 1978). Furthermore, it is found that the amendment may take effect sooner than 30 days following the date of its publication in the FEDERAL REGISTER because it relieves a restriction.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended as follows. . . .

The program official and lawyer principally responsible for this document are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegations of authority at 49 CFR 1.50 and 501.8.)

Issued on March 20, 1978.

Howard Dugoff  
Acting Administrator

**43 F.R. 12015**  
**March 23, 1978**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

## Air Brake Systems

(Docket No. 75-16; Notice 21)

This notice fulfills the remand of the Ninth Circuit Court of Appeals in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation* with regard to modification of test procedures, which is the only aspect of the order not subject to further judicial review. Test procedures and conditions are specified for frictional characteristics of the test track surface, duration of time intervals between road tests, duration of permissible wheel lockup during road tests, and the amount of curving in the test track. The agency also makes final a long-standing proposal to modify the means for establishing the frictional resistance of the road test surface.

**Dates:** The amendment is effective August 25, 1978. Petitions for reconsideration must be received no later than October 5, 1978.

**Address:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Tad Herlihy, Office of Chief Counsel; National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-9511).

**Supplementary information:** Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Requirements are established for the service, emergency, and parking brake systems, including a requirement that the service brakes provide retardation, power and

recovery capabilities. Road test procedures are set forth to advise manufacturers how the NHTSA will conduct its compliance tests of the manufacturers' products.

In January 1975, a truck manufacturer petitioned for judicial review of the standard's promulgation in accordance with § 105 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1394). The petitioner was subsequently joined by a trade association of truck users and a trade association representing the small manufacturers that complete trucks by mounting the bodies on incomplete truck chassis. The three actions were consolidated for argument in the Ninth Circuit U.S. Court of Appeals.

The Ninth Circuit recently entered its order on the petition for review and remanded the standard to the agency for further proceedings (573 F.2d 632). The Federal government has since petitioned for review of two aspects of that order in the Supreme Court. The purpose of this notice is to set forth the agency's actions in fulfillment of the third aspect of the remand, which was not a subject of the government's petition.

The court remanded several issues to the agency concerning the standard's test procedures, all of which are easily resolved by modifications in the standard's wording which do not affect the requirements for any person. The court stated that "the manufacturers are entitled to formal and reasonably specific testing criteria" in the area of frictional characteristics of the test track surface, duration of time intervals between repetitive road tests, duration of permissible wheel lockup during stopping distance tests, and the amount of curving in the test track.

Interpretation must be made of the court's remand on frictional characteristics of the test track. A first reading of the decision might suggest that a measurement technique (in the case, the "skid number" method of measuring road surface friction) may not be used in standards setting if it does not produce exact measurements. It is acknowledged that the skid number measurement has an accuracy tolerance, and that the tolerance can vary from measurement to measurement for a variety of reasons.

The agency does not believe the court intended this literal a reading, because no measurement can be exact as a matter of physical science. This exaggerated a reading of the decision would preclude all motor vehicle safety regulations, because all regulation involves measurement criteria and none is perfect. The agency's view is that the court objected only to reliance on a measurement technique that varies too widely in response to road surface conditions and that specified use of a no-longer-manufactured tire.

Because the tire specified is no longer manufactured, the NHTSA has already replaced the skid number measurement in all of its stopping distance standards other than 121. The only reason the technique was not replaced in Standard No. 121 was to comply with the Ninth Circuit's wish that the standard change as little as possible. (41 F.R. 24592; June 17, 1976). Now that review of the standard by the Ninth Circuit is complete, the agency can and does make final its longstanding proposal to use the new measuring technique. Comments received with regard to Standard No. 121 were discussed in conjunction with the June 1976 amendment.

The court also stated that the margin of variation in the measuring technique would not permit a manufacturer to conduct its tests by a means that ensured its vehicles would meet the requirement set forth in the standard. While the agency has always taken the position that an exact value (such as "skid number 75") is the clear and unambiguous way to state a legal requirement so that manufacturers are best on notice of what performance is required (e.g., 40 F.R. 47141; October 8, 1975), the agency can instead state a range of skid numbers in such a way that the manufacturer will be able to test to the exact

skid number encountered in its testing, knowing that its vehicle has complied with the standard so long as the number used falls within the specified range. Essentially, the test procedure can be restated as a range (representing the anticipated tolerance in the new measuring method) in which the manufacturer has its choice of what skid number it uses. As long as this range includes the criterion specified in the past by the NHTSA and is already being met by manufacturers, it is no more stringent than the past requirement. Similarly, the other skid numbers from which manufacturers could choose would fall in the range of those that they have been using previously, but without the certainty that the chosen number will be the one by which their vehicles are measured. This approach recognizes the physical impossibility of finding any measuring technique which is exact, and the agency finds that it accurately fulfills the court's remand. The skid number ranges established are from 20 to 30 for the wet surface, and from 71 to 81 for the dry surface, to reflect the different values obtained when the new test tires are used. It is noted that this revised specification of skid numbers is no more severe a requirement than the single values previously referenced in the standard.

As for the remaining test conditions which the court questioned, the agency has monitored these conditions as a part of its compliance program and the development of its compliance test procedures. It is apparent that manufacturers, permitted to choose reasonable values for these aspects of the test protocol in the absence of criteria set forth in the standard, have chosen values that fall within an easily adoptable level. No manufacturer, for example, has chosen to test on other than a straight test track, which is sensible in view of the fact that a straight track offers the easiest means of staying within a 12-foot-wide-lane. Comparably, no antilock manufacturer has chosen other than reasonable "wheel lockup" times for its antilock systems because overly long lockups significantly and adversely reduce the stopping performance of the brakes on the controlled axle, which would sacrifice the other major characteristics of the vehicle being measured—that is, stopping distance. As for the interval between dynamic tests of the vehicle, the relevant factor is the relationship between the

time interval and brake temperature, because a short interval could result in an adverse effect on braking capabilities due to fade or other thermal effects. Therefore, the NHTSA hereby adopts a specification for initial brake temperature, which will in turn determine the interval between tests. A review of NHTSA compliance test results has shown that the performance of all complying vehicles tested to date has been within the requirements specified in this amendment. Adoption of these values therefore does not adversely affect any person subject to the standard, and they can be incorporated for the benefit of remand without the delay occasioned by notice and opportunity for comment.

The decision to revise the standard in this fashion has been evaluated in accordance with the requirements of Executive Order 12044 (43 F.R. 12660; March 24, 1978) and the corresponding review procedures within the Department of Transportation (43 F.R. 9582; March 8, 1978). It has been determined that this rulemaking is governed by short-term judicial considerations and that, despite its connection with Standard No. 121, does not qualify as a rulemaking that raises issues of cost or controversy necessitating the level of review and comment contemplated by the two directives.

**Effective date:** With regard to the establishment of a new test tire for pavement resistance measurement, because the older test tire is no longer manufactured, and because the amendment of the procedure and test tire is intended only to duplicate the existing procedure and tire, this amendment creates no additional requirements for any person, and an immediate effective date is found to be in the public interest.

With regard to the modification of test procedures and conditions not based on a proposal, the agency finds that they do not impose additional requirements on any person, and that delay of a proposal is unnecessary and would be contrary to the public interest in responding to the court's remand as expeditiously as possible.

In consideration of the foregoing, Standard No. 121 is amended. . . .

The program official and lawyer principally responsible for this document are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 25, 1978.

Joan Claybrook  
Administrator





**PREAMBLE TO AMENDMENT TO  
MOTOR VEHICLE SAFETY STANDARD NO. 121  
Air Brake Systems  
(Docket No. 75-16; Notice 24)**

**Action:** Final rule and interpretation of court decision.

**Summary:** The U.S. Court of Appeals decision in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation* invalidated aspects of Standard No. 121, Air Brake Systems. This notice advises interested persons of the agency's interpretation of the *PACCAR* holdings, to guide continuing compliance with the standard. This notice also amends the standard as specified by the court to provide for "due care" certification.

**Effective date:** October 13, 1978.

**For further information contact:**

Tad Herlihy, Office of Chief Counsel,  
National Highway Traffic Safety Adminis-  
tration, 400 Seventh Street, B.W., Washing-  
ton, D.C. 20590 202-426-9511.

**Supplementary information:**

Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Requirements are established for the service, emergency, and parking brake systems of these vehicles. Truck braking systems are a particularly critical safety system, due to large variations between the unloaded and loaded weight conditions and the generally higher weight of trucks compared to other vehicles on the highway. Major requirements of the standard are that vehicles stop in specified distances and that the wheels not lock uncontrollably during these stops. The "no lockup" requirement ensures that skidding due to wheel lockup and loss of lateral stability is minimized.

In January 1975 a truck manufacturer petitioned for judicial review of the standard's promulgation in accordance with § 105 of the National Traffic and Motor Vehicle Safety Act (the Vehicle Safety Act) (15 U.S.C. § 1394) under which the standard

was issued. Petitioner PACCAR was subsequently joined by a trade association of truck users and a trade association representing the small manufacturers that complete trucks by mounting a body of specialized equipment on incomplete truck chassis. The three cases were consolidated for argument in the Ninth Circuit U.S. Court of Appeals.

The court's decision was issued in April 1978 (573 F2d 632, 9th Cir. 1978, Cert. denied October 2, 1978), and the mandate making it effective was entered October 11, 1978. Certain aspects of the standard were invalidated, and the purpose of this notice is to set forth the agency's interpretation of the court's specified holdings to guide continuing compliance with the standard. One of the court's three holdings, that concerning test procedures and conditions, has already been responded to by the agency (43 FR 39390; September 5, 1978).

**Invalidation of Certain Stopping Distances**

While expressing support for requirements that "decreas[e] the disparity of stopping distances between ordinary automobiles and heavier vehicles" and maintain "vehicle stability and directional control," the court was concerned about the safety of "heavier axles" in combination with the antilock systems used generally to provide "no lockup" performance. The court was concerned that a malfunctioning antilock system would allow wheel lockup of more aggressive front axle brakes more often or sooner than had been the case with weaker brakes, resulting in loss of steering control. The court's emphasis on the combination of aggressive front axle brakes and antilock is clear in the opinion:

As new components—strong front axles, new brake linings, and mini-computers to control wheel lock and skid—were mass-produced, and subsequently *put together in a unique combination*, grave problems developed (emphasis supplied) 573 F2d at 641.

In referring to "heavier axles", the court was describing the brake retardation levels supplied by manufacturers to obtain the 258-foot (and subsequent 277-foot) 60-mph stopping distances specified by the standard prior to February 26, 1976. The 60-mph stopping distances were extended to 293 feet on that date (41 FR 8783; March 1, 1976) and have resulted in significant reduction in retardation force levels. The court did not take this change into account, because the Record filed with the court and the July 1976 oral argument contained no information about the performance of the vehicles built after February 26th to conform to the 293-foot distance. The agency received no petitions for reconsideration of the brake force levels established by the March 1976 notice.

The court held, with regard to stopping distances,

...those parts of the Standard requiring heavier axles and the antilock device should be suspended. The evidence indicates that this can be accomplished if we hold, as we do, that the stopping distance requirements from 60 mph are invalid... We hold only that more probative and convincing data evidencing the reliability and safety of vehicles that are equipped with antilock and in use must be available before the agency can enforce a standard requiring its installation. 573 F2d at 643.

These two statements of the holding differ from one another, the first specifying both "heavier axles" and "the antilock device" for invalidation, while the second only specifies antilock. The text of the opinion (located at footnote 26) indicates that the court actually equates "stopping distance" with "the antilock requirement." The agency concludes that the court intended to invalidate "the stopping distance requirements from 60 mph" only insofar as a combination of high retardation force levels and a malfunctioning antilock would cause stability problems beyond those in vehicles built before the standard's effective date. At the same time the court was clear that the "no lockup" requirements were invalidated for both trucks and trailers.

It is therefore the agency's view that the "no lockup" portions of S5.3.1 and S5.3.2 insofar as they apply to trucks and trailers are invalid, along with the related stopping distances of 293 feet for service brake capability and 613 for emergency brake capability (720 for truck-tractors in the

unloaded condition) established for 60-mph loaded and unloaded stopping tests under S5.3.1 and S5.7 for trucks. For those trucks with a speed attainable in 2 miles of less than 60 mph, the agency believes that the "top speed" stopping distance specified by S5.3.1.1 for both service brake and emergency brake stopping tests are invalid.

The agency does not believe that any requirements of Standard No. 121 are invalidated for buses because of the court's statement in footnote 1 that "[t]he part of the Standard that regulates air-braked buses is not at issue here." It is clear that the court was aware of the experience of buses built to conform to the standard, as evidenced by the court's reliance on statements by bus operators (footnote 43) and discussion of the rulemaking history for buses (text following footnote 25). The court's explicit removal of bus requirements from its consideration seems a clear intent to limit the ambit of its decision to trucks and trailers.

The agency concludes that only the actual stopping distances from 60-mph (or top speed) are invalidated and not other requirements that bear on performance of the vehicle. This understanding of the court decision fulfills the court holding cited above, while it does not disturb braking characteristics which do not present potential adverse handling characteristics. Thus, the stopping test sequence in which the truck or trailer must remain within a 12-foot lane from 60 mph (or top speed) is not invalid, while the requirement to stop within a specified distance is invalid.

The dynamometer requirements of S5.4 for trucks and trailers also were not affected by the court's holding. It does appear that the requirement for 90 p.s.i. air pressure in the trailer control line during the stop constitutes a portion of the "no lockup" requirement and is therefore invalidated by the court. Collateral requirements such as air reservoir volume that may be indirectly based on "no lockup" performance are not affected by the court decision.

A secondary reason to conclude that the testing from 60 mph remains in the test sequence is that manufacturers must continue to certify compliance with 20-mph stops and x parking brake test following certain 60-mph stops. The 60-mph stops affect the brake linings and could affect results of other portions of the testing if they are dropped from the test sequence.



With regard to the invalidated portions of the standard, the agency expects to publish a *Federal Register* notice shortly that sets forth its plans.

#### "Due Care" Certification

The court expressed concern about the certification responsibilities of the "final stage" manufacturers that mount the body or specialized equipment on mass-produced truck chassis built by other manufacturers. Section 114 of the Vehicle Safety Act (15 U.S.C. § 1403) specifies that the manufacturer or distributor of a motor vehicle shall certify that its product conforms to all applicable Federal motor vehicle safety standards. The agency has issued regulations that divide the responsibility for certification of "multistage" vehicles among the "incomplete vehicle manufacturers" of the chassis, any "intermediate stage" manufacturer involved, and the "final stage" manufacturer that completes the vehicle (49 CFR Parts 567, 568).

Standard No. 121 sets forth performance requirements that air-braked vehicles must conform to, and further sets forth the testing conditions under which the performance must be met (paragraph S6, *Conditions*). The requirements include a specification that certain stopping and wheel control capabilities be available under certain conditions, including stops from 60-mph and 20-mph in the unloaded and loaded conditions. The standard does not require that manufacturers subject their vehicles to these stops. It is accepted that the smaller final-stage manufacturers may not in all cases have the resources and capabilities to conduct such testing. The agency has regularly stated that a manufacturer may meet its statutory certification requirements either through demonstration of the specified stops or by any other chosen means that fulfills the related statutory requirement that a manufacturer must exercise "due care" in certification (15 U.S.C. § 1397(b)(2)). The agency has not stated to any final-stage manufacturer what its "due care" responsibility might consist of, in recognition of the reality that "due care" is essentially a judicial concept that is determined on a case-by-case basis in light of the factual situation facing the particular manufacturer at the time of certification. Because the engineering and financial resources available to a particular manufacturer are not fixed, what constitutes "due care" would vary among manufacturers, and even vary from day-to-day for the same manufacturer, making such a statement by the agency impracticable.

The court was sympathetic to the situation of the smaller final-stage manufacturer in holding that—

... Since NHTSA has admitted that road testing is beyond the practical and financial reach of the final stage manufacturers, it must propose some alternative method for those manufacturers which, if followed, it will recognize as fulfilling the due care requirement. 573 F2d at 645.

Fortunately, an alternative to road testing does exist that would constitute "due care" in certification by any final-stage manufacturer that adopted it, whatever its resources and engineering expertise. Parts 567 and 568 obligate the incomplete vehicle manufacturer to provide a basis for complete certification (the "incomplete vehicle document") with each vehicle, which can be used for certification as long as the final-stage manufacturer does not violate an "envelope" of conditions listed in the document as the reasonable limits to which the incomplete vehicle manufacturer has already tested. A final-stage manufacturer can avoid any road testing simply by a "pass through" of this incomplete vehicle document. Of course, it would be a logical impossibility for the agency to specify what constitutes "due care" for the infinite number of configurations that exceed the "envelope" of conditions in advance of the manufacturer's decision to do so.

The problem, as noted by the court, is that the final-stage manufacturer only had assurances from the agency in the past that conformity to the incomplete vehicle document would constitute the exercise of due care in complying with Standard No. 121. What is required by the court's holding, in the agency's view, is the modification of Standard No. 121 itself to state a certification of compliance based on adherence to the incomplete vehicle document would constitute the exercise of due care. This is accomplished by this notice.

It is recognized that trailers and buses other than school buses are typically manufactured in one stage and this alternative method is unavailable to these vehicles. However, the court's holding discusses only the obligations of final-stage manufacturers that, by definition, only exist in the case of multistage manufacture.

In accordance with Department of Transportation policy for the analysis of regulatory actions, it is found that the amendment concerning due care does not constitute a significant regulation that requires regulatory analysis. Evaluation of the

change indicates that it will have no economic effects other than a potential reduction of certification costs for some final-stage manufacturers.

*Findings.* Because the amendment constitutes an alternative method of compliance and creates additional requirements for no person, it is found for good cause shown that notice and opportunity for comment are unnecessary and that an effective date sooner than 30 days from the date of publication is in the public interest. The court's holding with regard to "no lockup" and stopping distances take effect independently of administrative action by the agency.

In consideration of the foregoing, paragraph S6 of Standard No. 121 (49 CFR 571.121) is amended by the addition of a sentence at the end of the text to read as follows:

"Compliance of vehicles manufactured in two or more stages may, at the option of the final-stage manufacturer, be demonstrated to comply with this standard by adherence to the instructions of the incomplete vehicle manufacturer and any intermediate-stage manufacturer provided with the vehicle in accordance with § 568.4(a)(7)(ii) and § 568.5 of Title 49, Code of Federal Regulations."

The program official and lawyer principally responsible for the development of this document are Duane Perrin and Tad Herlihy, respectively.

Issued on October 13, 1978.

Joan Claybrook  
Administrator  
**43 F.R. 48646**  
**October 19, 1978**



**PREAMBLE TO AMENDMENT TO  
MOTOR VEHICLE SAFETY STANDARD NO. 121  
Air Brake Systems  
(Docket No. 75-16; Notice 25)**

*Action:* Final rule.

*Summary:* This notice amends the air brake standard to further extend existing exclusions for heavy hauler trailers, auto transporters, and other specialized vehicles from certain requirements and withdraws two recent changes in road test procedures. These actions follow judicial review of the standard, and are intended to provide direction with regard to the future of the air brake standard.

*Dates:* Effective date of amendments is December 18, 1978.

*Addresses:* Petitions for reconsideration should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

*For Further Information Contact:*

Mr. Duane Perrin, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202) 426-2153.

*Supplementary Information:* Standard No. 121, Air Brake Systems (49 CFR 571.121); regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Requirements are established for the service, emergency, and parking brake systems of these vehicles.

**Test Procedures**

Certain aspects of the air brake standard were invalidated by court action in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation*, 573 F2d. 632 (9th Cir. 1978), cert. denied \_\_\_\_\_ U.S. \_\_\_\_\_ (October 2, 1978) (47 U.S.L.W. 3190 (Sup. Ct.)) as detailed in a recent agency notice (43 FR 48646; October 19, 1978). The agency fulfilled the court's remand with regard to modification of test procedures on August 25, 1978 (43 FR 39390;

September 5, 1978), by means of several amendments. Notice and opportunity for comment were not provided, because the NHTSA judged that the modifications would not involve additional requirements for any person and reinstitution of the test procedures was found to be in the public interest. However, six petitions for reconsideration of some of the modifications have been filed by parties that argued the changes may or do in fact cause some changes in the standard's requirements.

In response to the court's order for a specific criterion for the interval between repetitive tests, the standard was amended to specify initial brake temperatures prior to the tests. Brake temperatures are partly a function of the time that brakes have to cool between tests.

Freightliner Corporation objected to the specification of a 150° to 200°F. initial brake temperature for stopping tests as the agency's method of establishing the test intervals. Freightliner explained that some of its brake designs could not provide the required 60-mph stopping distances if initial brake temperatures were above 180°F. The other commenters, in contrast, pointed out that metallic linings and disc brake technology argued for a higher initial brake temperature in some cases. The American Trucking Associations (ATA) suggested specification of a time period between repetitive tests as a means of fulfilling the court remand for test intervals.

In view of these possible substantive changes represented by the specification of an interval between repetitive road tests, the agency concludes that the wisest course of action would be to revoke the initial brake temperature specification and propose a new method, following consideration of the data and suggestions supplied by manufacturers. Withdrawal of the test interval specification is accomplished in this notice.



All petitioners requested that the modification of skid number specification be reconsidered. The agency met the court's objection to specification of a single value for the "skid resistance" characteristics of the test track by substitution of a range of permissible values. Commenters differed significantly with the agency both over the meaning of the court's opinion and the consequence of the modification adopted by NHTSA. Although the NHTSA does not believe that its modification had a substantive effect on the requirements of the standard, it is clear that there is a difference of opinion about the court's holding, and the NHTSA again considers the wisest course of action to be revocation of the skid number range to permit a proposal and opportunity for comment. The substitution of the updated and uncontroversial ASTM test method and tire is not revoked.

No other aspect of the test procedure modifications was cited by commenters as a source of specific concern.

As for the period of time that the skid number range and initial brake temperature requirements were in effect (from August 25th to the date of publication of this notice), the agency hereby states that it will not pursue cases that arose as a consequence of these requirements during the short period that they were effective.

#### Vehicle Exclusions

Auto transporters and heavy hauler trailers have been excluded from Standard No. 121 until January 1, 1979, due to the distinctive construction or use of these vehicles that make compliance with certain aspects of the standard more difficult. Four years of additional time were granted to manufacturers of these vehicles in order for them to work out solutions to their distinctive equipment problems. The Truck Trailer Manufacturers Association (TTMA) recently petitioned the NHTSA for permanent exclusion of heavy hauler trailers from the standard, based on hardware problems and related reasons.

The NHTSA proposed some continued exclusions for these and related vehicle types (43 FR 41056; September 14, 1978). The nature of the proposed exclusions was based on equipment space considerations, rough terrain use of some of the vehicles, and most importantly, on the uncertainty over future road testing requirements created by pendency of the Ninth Circuit litigation. It was accordingly proposed that heavy hauler trailers and auto transporters be temporarily excluded

from stopping distance requirements, including the "no lockup" and related reservoir size requirements. Also, heavy haulers, pulpwood trailers, and straddle trailers would be permitted the same option as agriculture trailers and converter dollies have to meet only the emergency breakaway requirements and no parking brake requirements.

The proposed temporary exclusions from the road test and reservoir volume requirements were supported by Freightliner and General Motors, manufacturers of tractors for auto transporter use, and by Delavan Industries, Inc., an auto transporter manufacturer. The California Highway Patrol (CHP) and Wagner Electric Co., a brake component manufacturer, expressed concern that the exclusions not be made permanent, and that these vehicles eventually be required to exhibit the same performance as other air-braked trucks and trailers. No date for compliance was suggested. TTMA requested a review of the reservoir volume requirements for all vehicles in light of the *PACCAR* decision, and suggested a reduced volume requirement for trailers. No other comments on these subjects were received.

This amendment makes final the temporary exclusions from road test and reservoir volume requirements for heavy hauler trailers and auto transporters. No termination date for the exclusions was proposed or is made in the final rule, but manufacturers of these vehicles must be and are hereby placed on notice that these exclusions are not made as permanent exclusions. The temporary exclusions will therefore remain in effect until a final decision is made regarding the reservoir volume and stopping distance requirements for all vehicles. Notice and opportunity for comment will precede any amendment of the reservoir volume and stopping distance requirements.

The CHP requested rewording of the exclusion of auto transporter tractors from the road test requirement in S5.7.1, to avoid confusion over the reference to such requirements in S5.7.3. The wording is changed to expand the exclusion to both S5.7.1 and S5.7.3.

The proposed permanent exclusion from the parking brake requirements for heavy hauler trailers was supported by TTMA and Fontaine Truck Equipment Co., a heavy hauler trailer manufacturer. The CHP expressed the desire that the exclusion be only temporary, and be reviewed

in the future when more compact parking brake designs are available. The National Automobile Transporters Association (NATA), and two auto transporter manufacturers, Delavan and Cottrell-Sullivan, requested permanent exclusion from the parking brake requirement for auto transporter trailers as well. Reasons cited were the problems of mounting the parking brake components and the associated air reservoirs without loss of cargo-carrying capacity, lack of availability of more compact hardware, and the short lead time to redesign equipment by January 1, 1979. NATA also noted that auto transporters usually operate as married units, and have a good safety record. Another manufacturer, Traffic Transport Engineering, requested permanent exclusion from the entire standard, based on the same arguments.

The NHTSA is aware that auto transporter manufacturers are presented with difficult hardware packaging problems related to parking brakes on trailers, but is also aware that prototype auto transporters have been built to full compliance with the standard about two years ago. This constitutes strong evidence that such systems can be built on a production basis, and the agency takes note that manufacturers of auto transporters have had four years longer to solve their hardware problems than manufacturers of other types of trailers.

Nevertheless, the agency also recognizes that the availability of new, more compact parking brake systems is dependent on the proposed changes in the parking and emergency brake requirements, which have not yet been implemented. Some additional delay of applicability of the parking brake requirement for auto transporters therefore appears reasonable. An additional delay of one year is provided, with the expectation that any changes in the parking brake requirements will be made final by early 1979, allowing sufficient lead time for manufacturers to incorporate such changes in their trailers. Requests for permanent exclusion from the parking brake requirements or the entire standard for auto transporters are denied, on the grounds that it has been demonstrated that complying vehicles can be designed without significant loss of cargo carrying capacity, and that the additional year's exclusion should compensate for any lead time difficulties. Unlike heavy hauler trailers, auto transporter trailers are not subjected to the same off-road environment that formed the basis for excluding certain vehicle types from the parking

brake requirement. The proposed parking brake exclusion of heavy hauler and other trailers is adopted as proposed.

TTMA and three of its members—Birmingham Manufacturing Co., Ferree Trailer Corp., and Fontaine Truck Equipment Co.—repeated their requests for permanent exclusion from the entire standard for heavy hauler trailers, and expressed dismay that all of the points raised in their petition for exclusion had not been addressed in the preamble to the agency's proposal. The NHTSA regrets the brevity of its treatment of the issues in the proposal, but it should not be interpreted as a lack of attention or concern for the problems of the heavy hauler industry. A detailed discussion of the petition and comments to the proposal is being prepared. Copies will be sent to the TTMA and parties who commented on the proposal, and placed in the public docket. Because of its length and technical nature, it is only summarized here.

To place the subject in perspective, it is necessary to first see what portions of the standard apply to heavy hauler trailers. Section S5.1 and S5.7 of the standard apply only to trucks and buses. By this notice, heavy hauler trailers have been permanently excluded from S5.6, and temporarily excluded from S5.3 and parts of S5.2. Section S5.5 applies only if the trailer is antilock-equipped, which is not required according to the Ninth Circuit decision. To the NHTSA's knowledge all heavy hauler trailers already are complying with the applicable portions of S5.2 and S5.8, because of industry standards or BMCS requirements. Thus the only remaining requirements that could necessitate any change in the vehicles are the dynamometer requirements of S5.4.

The assertion that is presented in the TTMA petition, and repeated in the comments to the proposal, is that compliance with Standard No. 121 will necessitate the addition of more axles, resulting in substantially increased cost. This possibility arises because of the current method of rating the capacity of heavy hauler trailers. Axle weight ratings (GAWR's) depend upon the load-carrying capacity of the axle, rims, and tires, and the torque capability of the brakes on the axle. According to industry standards, tires can be rated for higher loads if speed is restricted. Current practice is to rate heavy hauler trailers according to the capacity of the axles and tires, using the tire load capacity ratings at 20 mph. The brakes used



are currently not considered in axle rating calculations for the restricted speed rating.

For a trailer subject to Standard No. 121, however, the dynamometer requirements of S5.4.1 require that the brake retardation capability be proportional to the GAWR's. If the retardation capability of the brakes on a trailer is insufficient to meet the minimum performance requirement, a manufacturer must either install more powerful brakes or "derate" the axles to bring the GAWR's in line with the braking capability afforded. In the case of heavy hauler trailers, manufacturers say that they are already using the most powerful brakes available for 15-inch wheels, and those brakes are rated at only 17,000 pounds per axle. The manufacturers assert that since nearly all heavy hauler trailer axles are currently rated for a higher load, the derating to 17,000 pounds per axle necessitated by consideration of brakes in the rating calculations would require them to add more axles to provide the same overall capacities for their trailers.

The data supplied, however, do not support this view. The dynamometer tests are run at 50 mph, and therefore the 17,000-pound axle rating for brakes is a factor in determining the GAWR at that speed. Examination of the load ratings of the tires typically used on heavy hauler trailers (8.25 x 15 and 9.00 x 15) show that their ratings at 50 mph are below 17,000 pounds per axle. Therefore, the tires are the limiting element in determination of GAWR at 50 mph, and the brakes currently being used on these trailers already comply with the dynamometer requirements of the standard with the tires employed.

The misunderstanding apparently arises from the current practice of rating heavy hauler trailers at 20 mph. It is noted that while § 567.4(h)(3) of NHTSA certification regulations (49 CFR Part 567) allows manufacturers to specify GVWR-GAWR ratings for operation of a vehicle at restricted speeds in addition to the unrestricted ratings, the GAWR used for determination of compliance with the dynamometer requirements must be that corresponding to a speed not less than the dynamometer test speed (50 mph). Testing at the restricted speed GAWR would represent an overloaded condition at the dynamometer test speed. The portion of the dynamometer test conditions dealing with GAWR (S6.2.1) is hereby amended to clarify this fact. The only trailers that would actually have to be derated (at 50 mph)

would be those using 10.00 x 15 or 11.00 x 15 tires. Very large heavy hauler trailers (over 50 ton capacity) are not affected because they are already permanently excluded by virtue of having a gross vehicle weight rating over 120,000 pounds.

In view of the longer than anticipated time for response to the TTMA petition and the short time remaining before the existing January 1979 effective date, the NHTSA has decided to and hereby delays the effective date for institution of the dynamometer requirements for heavy hauler trailers to July 1, 1979, as requested by TTMA.

CHP suggested changing the word "agriculture" to "agricultural" in the definition of a commodity trailer, and deletion of the phrase "an arrangement of air control lines and reservoirs that minimizes damage in field operation" because it is vague. Midland-Ross commented that straddle trailers would be included in the agricultural commodity trailer definition, and that a separate definition is unnecessary. CHP suggested that the term "logging trailer" be used instead of "pulpwood trailer", and that the definition be reworded to be similar to the definition of agricultural commodity trailer. CHP also suggested deleting the reference to hydraulic lifting arms in the case of straddle trailers, because it is too design restrictive. The NHTSA agrees with the spirit of these suggestions but, in the interests of preserving continuity in interpretation of existing terminology, the changes are only made where they do not conflict with wording already in the standard or in previous interpretations of it.

It is noted that the comments on the parking and emergency brake aspects of the September 14th notice have convinced the NHTSA that further consideration should precede rulemaking changes in this area.

In accordance with Department of Transportation policy for the analysis of regulatory actions, it is found that these amendments of Standard No. 121 do not have significant impact as defined in the Department's criteria for internal review. The changes all permit greater manufacturing flexibility and do not impose any additional requirements. The implementation of some of the standard's requirements for heavy hauler trailers and auto transporters reflects the termination of an exclusion, not new agency action. It is also found that no significant adverse environmental impact will result from these amendments.



In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended . . . .

*Effective date finding:* Due to the short time remaining before vehicles would have to be modified to comply with the established January 1979 requirements, it is found that notice and opportunity for comment on the delay of the dynamometer requirements for heavy hauler trailers to July 1, 1979, and the parking brake requirements for auto transporter trailers to January 1, 1980, is impracticable and contrary to the public interest in establishing the final

requirements as early as practicable. For the same reason, it is found to be in the public interest to make the relieving amendments effective immediately.

The program official and lawyer principally responsible for the development of this document are Duane Perrin and Tad Herlihy, respectively.

Issued on: December 11, 1978.

Joan Claybrook  
Administrator  
**43 F.R. 58820**  
**December 18, 1978**



**PREAMBLE TO AMENDMENT TO  
MOTOR VEHICLE SAFETY STANDARD NO. 121**

**Air Brake Systems—Interpretative Amendment**

**(Docket No. 75-16; Notice 26)**

*Action:* Final rule.

*Summary:* This notice amends the language of Air Brake Standard 121 to reflect the U.S. Court of Appeals decision in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation*. This action is intended to clear up any confusion about the effect of the court's decision on portions of the standard.

*Effective date:* August 9, 1979.

*For further information contact:*

Roger Tilton, Office of Chief Counsel,  
National Highway Traffic Safety Administration,  
400 Seventh Street, S.W., Wash-  
ington, D.C. (202-426-9511).

*Supplementary information:* Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect since January 1975 for trailers and March 1975 for trucks and buses. Petitions for judicial review of the standard were filed and resulted in invalidation of three aspects of the air brake regulation (see *PACCAR v. NHTSA and DOT*, 573 F.2d 632, Cir. 1978, cert denied, October 2, 1978). The agency explained its interpretation of the court's action in three *Federal Register* notices (43 FR 39390, September 5, 1978; 43 FR 48646, October 19, 1978; 43 FR 58820, December 18, 1978) and in several meetings held with equipment and vehicle manufacturers and air-brake vehicle users.

It has become apparent that some confusion exists with regard to the agency's interpretation of the combined effect of two aspects of the court's decision. The first is the agency's view that the court invalidated the "no lockup" por-

tions of S5.3.1 and S5.3.2 insofar as they apply to trucks and trailers, along with the related stopping distances of 293 feet for service brake capability and 613 feet for emergency brake capability (720 for truck-tractors in the unloaded condition) established for 60-mph loaded and unloaded stopping tests under S5.3.1 and S5.7 for trucks. The second is the agency's view that the court invalidated the "skid number" measurement technique of test surface frictional characteristics for use in measuring whether trucks meet the strict stopping distance requirements of the standard. The Court found that while the "skid number" of a surface is an objective measurement, it is not a practicable test method for manufacturers since normal fluctuations for a given road surface would require manufactures to overcompensate by testing their vehicles on road surfaces substantially slicker than the regulation requires. The agency acted to correct the skid number variability problem and measurement technique but subsequently withdrew the correction as it related to skid number variability because of disagreement both over the meaning of the court's opinion and the consequences of the modification adopted (43 FR 58820; December 18, 1978).

Several references by the agency to the fact that the court did not invalidate stopping distance requirements other than the 60-mph stops for trucks have apparently been taken to mean that the agency is in a position to enforce compliance with all remaining stopping distances. The fact that the standard's stopping distances remain completely valid for buses may contribute to this view. In fact, the court's remand to the agency of the skid number specification and duration of time interval between repetitive road



tests effectively precludes the agency from enforcing compliance with any road test requirement for trucks and trailers at any speed on wet or dry surfaces. It is apparent that amendment of the language of the standard to reflect the court's actions would be beneficial to end any confusion that may exist. The purpose of this notice is to make that amendment.

It is noted that this action has no effect on the requirements for buses, or on the application and release timing, dynamometer, or parking brake requirements for all vehicles. For this reason, the NHTSA is not amending the test procedures which are applicable to vehicles or requirements other than those addressed by the court.

The agency is amending the application section of the standard to state that trucks and trailers need not comply with certain paragraphs of the regulation. The regulation is being amended in this manner rather than deleting or revising the wording of each of the affected sections in order to disturb the actual text of the standard as little as possible. In that way, the affected sections can most easily be reinstated when suitable solutions to the requirements laid down by the Court are found. In addition, by retaining the standard's language in its existing form, manufacturers are made aware of what the agency still considers to be reasonable standards for minimum acceptable performance, and those manufacturers that wish to construct their vehicles in accordance with the non-mandatory

sections of the standard will have the necessary guidance to do so. The agency also has taken this opportunity to delete from S3 references to temporary exclusions which have expired.

*Effective date finding:* The agency is issuing an interpretative amendment that merely conforms that standard's language to its meaning following the remand by the Ninth Circuit, and therefore the amendment does not change the standard in any respect. Accordingly, it is found for good cause shown that notice and opportunity for comment are unnecessary and that an effective date for the amendments sooner than 30 days from the date of publication in the *Federal Register* is justified.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended by replacing the last paragraph of S3 with the following paragraph:

Notwithstanding any language to the contrary, sections S5.3.1, S5.3.1.1, S5.3.2, S5.3.2.1, S5.3.2.2, S5.7.1 and S5.7.3 of this standard are not applicable to trucks and trailers.

The program official and lawyer principally responsible for the development of this document are Duane Perrin and Roger Tilton, respectively.

Issued on: August 3, 1979.

Joan Claybrook  
Administrator

**44 F.R. 46849**  
**August 9, 1979**

**PREAMBLE TO AMENDMENT TO  
MOTOR VEHICLE SAFETY STANDARD NO. 121**

**Air Brake Systems—Parking Brakes**

**(Docket No. 75-16; Notice 27)**

*Action:* Final rule.

*Summary:* This notice amends the air brake standard to expand the latitude which a vehicle manufacturer has in selecting means to comply with the parking brake requirements. The amendment makes final one of several changes to the parking and emergency brake requirements that had been proposed previously. The other proposed changes have been reexamined in light of comments to the proposal and to a separate proposal outlining plans for replacement of FMVSS 121 by a new standard. . The NHTSA has decided to suspend rulemaking action on those items until research results and other further information is available.

*Effective date:* August 9, 1979.

*For further information contact:*

Mr. Duane Perrin, Office of Crash Avoidance,  
National Highway Traffic Safety Administration,  
Washington, D.C., 20590 (202-426-  
2153).

*Supplementary information:* Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. The standard contains requirements for service brake systems, emergency brake systems, and parking brake systems.

More than four years' experience with the standard on the part of manufacturers, users, the agency, and other interested parties indicate a possibility that some of the emergency and parking brake performance requirements could be more broadly stated to allow new design options that offer a level of safety equivalent to that

offered by existing designs. On September 14, 1978, the NHTSA issued a notice of proposed rulemaking (43 FR 41056) that would have substantially revised the parking brake requirements for all vehicles and the emergency brake requirements for trailers. Subsequent to the issuance of that proposal, a mandate was issued by the U.S. Court of Appeals for the Ninth Circuit, invalidating certain aspects of FMVSS 121 (43 FR 48646, October 19, 1978). In light of the court decision, the NHTSA has tentatively decided to issue a new heavy duty vehicle brake standard, FMVSS 130, which will eventually replace FMVSS 121. An Advance Notice of Proposed Rulemaking (ANPRM) on Standard No. 130 was issued in February (44 FR 9783, February 15, 1979).

Responses to the ANPRM on Standard No. 130 underscored the need for stability in the industry. To achieve stability, commenters suggested avoiding unnecessary changes in Standard No. 121, which remains in effect until FMVSS 130 is issued. In addition, commenters on the September notice pointed out areas where some of the proposed changes need further research and consideration. For these reasons, most of the changes to the parking and emergency brake sections of Standard No. 121 that were proposed in September are being tentatively put aside. Some of the changes proposed in the September notice may be raised again in the new proposal for Standard No. 130, after further information is obtained by the agency.

The NHTSA has determined, however, that one of the proposed changes should not be delayed until rulemaking is completed on FMVSS 130. That change allows the application of parking brakes by means of service brake air, as long

as the application can be made when a failure exists in the service brake system, and as long as the parking brake is held in the applied position by mechanical means. The standard previously required parking brakes to be applied by a separate energy source, and this change allows an alternative to the spring-applied parking brake systems now used. The alternative systems could be less costly and have essentially the same performance as current systems. In addition, the change allows more compact systems to be produced for vehicles such as auto transporters where space for mounting of components is at a premium.

The changes to the parking brake application requirements proposed in September (Docket No. 75-16; Notice 22) were opposed by the California Highway Patrol (CHP), on the assumption that a diaphragm inside a brake chamber is considered part of the brake chamber housing, and that the proposal would have allowed a reduction in safety over current systems. Previous interpretations, however, have clarified that a brake chamber housing is only the outer body of the chamber and does not include the diaphragm. Thus, the prescribed performance must be achieved with any type of failure in the service brake system, including a ruptured diaphragm. The NHTSA concludes, therefore, that this interpretation satisfies the concerns of the CHP. The CHP also suggested a slight rewording to indicate that the required force is applied at the drawbar and not in the parking brake itself. The wording has been changed somewhat to clarify that point.

The American Trucking Associations (ATA) and Transquip Industries objected to the proposal because it would require a second reservoir on an air-applied parking brake system in order for the parking brakes to be applied in the event of a failure of the service reservoir. The NHTSA understands that the use of only one reservoir would reduce cost. However, it would also offer a significant reduction in performance as compared to present systems, because certain service brake system failures could occur for which there would be no secondary means of braking the vehicle. Accordingly, the NHTSA concludes that ATA and Transquip Industries'

objections do not warrant any change in the amendment.

Traffic Transport Engineering, an auto transporter manufacturer, requested clarification of whether two relay valves would be required in an air-applied system, since the parking brakes would have to be capable of application with any single failure, and the relay valve could fail. Since relay valve failures are relatively common, the NHTSA considers it necessary to preserve the performance achieved by present systems. Currently, the failure of a relay valve would not prevent emergency application of the trailer brakes. Thus, if a manufacturer chooses to equip a trailer with air-applied parking brakes, he would have to devise a means of achieving a brake application in case of failure of the service brake relay valve. That could be accomplished by using a second relay valve and reservoir.

The Dolphin Brake Corporation asked for clarification of the proposed wording to determine whether or not their parking brake that applies by means of hydraulic fluid would meet the requirements. The NHTSA believes that the wording is sufficiently clear to indicate that, like an air-applied system, such a brake would only meet the requirements if a mechanical means of holding the application in the event of loss of fluid pressure were incorporated.

In order to minimize changes to FMVSS 121, the amended wording for application and holding will remain in one paragraph, S5.6.3, as currently in the standard.

Since this amendment relieves a restriction it is being made effective immediately.

In consideration of the foregoing, the first sentence of paragraph S5.6.3 of Standard No. 121 (49 CFR 571.121) is amended . . .

The principal authors of this notice are Duane Perrin of the Office of Crash Avoidance and Roger Tilton of the Office of Chief Counsel.

Issued on August 6, 1979.

Joan Claybrook  
Administrator

**44 F.R. 46850**  
**August 9, 1979**



**PREAMBLE TO AMENDMENT TO  
MOTOR VEHICLE SAFETY STANDARD NO. 121**

**Air Brake Systems**

**(Docket No. 75-16; Notice 28)**

*Action:* Correction.

*Summary:* On August 9, 1979, the NHTSA published in the *Federal Register* a final rule amending the applicability section (S3) of Standard No. 121, *Air Brake Systems*. That notice, which added a sentence to the end of S3, contained an error in its reference to section S5.7.3. The notice appears to show that the entire section of S5.7.3 no longer applies to trucks and trailers, when the agency intended only for subparagraphs (a) and (b) to be inapplicable to trucks and trailers. These vehicles do have to comply with S5.7.3(c). Accordingly, the August 9 notice is corrected by changing the last sentence of section S3 to read: Notwithstanding any language to the contrary, sections S5.3.1, S5.3.1.1,

S5.3.2, S5.3.2.2, S5.7.1, S5.7.3(a) and S5.7.3(b) of this standard are not applicable to trucks and trailers.

*Effective date:* September 13, 1979.

*For further information contact:*

Mr. Scott Shadle, Office of Crash Avoidance,  
National Highway Traffic Safety Administration,  
Washington, D.C. 20590 (202 426-  
2153).

Issued on September 4, 1979.

Michael M. Finkelstein  
Associate Administrator for  
Rulemaking

**44 F.R. 53166  
September 13, 1979**



**PREAMBLE TO AMENDMENT TO  
MOTOR VEHICLE SAFETY STANDARD NO. 121**

**Air Brake Systems—Correction**

**(Docket No. 75-16; Notice 29)**

*Action:* Final rule; correction.

*Effective date:* October 1, 1979.

*Summary:* On August 9, 1979, the NHTSA published in the *Federal Register* a final rule amending the applicability section (S3) of Standard No. 121, *Air Brake Systems*. On September 13, the agency published a correction of that final rule. An error was made in the September 13, correction when reference to section S5.3.2.1 was inadvertently deleted from the notice. Accordingly, the final rule is corrected by changing the last sentence of section S3 to read: Notwithstanding any language to the contrary, §§ 5.3.1, 5.3.1.1, 5.3.2, 5.3.2.1, 5.3.2.2, 5.7.1, 5.7.3(a) and 5.7.3(b) of this standard are not applicable to trucks and trailers.

*For further information contact:*

Mr. Scott Shadle, Office of Crash Avoidance,  
National Highway Traffic Safety Adminis-  
tration, Washington, D.C. 20590 (202-426-  
2153).

Issued on September 25, 1979.

Michael M. Finkelstein  
Associate Administrator for  
Rulemaking

**44 F.R. 57100  
October 4, 1979**





# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 121**

## **Air Brake Systems (Docket No. 79-03; Notice 4)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends Standard No. 121, Air Brake Systems, to require trucks, buses and trailers equipped with air brakes to have service brake systems acting on all wheels. This amendment is being made in response to reports from several manufacturers that some trucks and trailers were soon to be constructed without front axle brakes. The agency concludes that such a change would result in a serious downgrading of existing brake systems and, accordingly, issues this amendment to prevent this from happening.

**EFFECTIVE DATE:** This amendment is effective July 24, 1980

**FOR FURTHER INFORMATION CONTACT:**

Mr. John Machey, Crash Avoidance Division,  
National Highway Traffic Safety  
Administration, 400 Seventh  
Street, S.W., Washington, D.C. 20590  
(202-426-1714)

**SUPPLEMENTARY INFORMATION:** On October 18, 1979, the agency published a notice of proposed rulemaking (44 FR 60120) proposing the implementation of a small part of a new safety standard, Standard No. 130, Heavy Duty Vehicle Brake Systems. The agency has also issued two ANPRMs relating to long- and short-term rulemaking issues concerning Standard No. 130. Resolution of the issues raised in those notices will occur after all necessary agency research and analyses have been completed. The October 18 notice, which was very limited in its scope, proposed the implementation of a requirement that heavy duty vehicles have brakes acting on all wheels. The requirement was proposed in response to a developing problem that was brought to the agency's attention by both

vehicle and equipment manufacturers concerning front axle brakes.

Standard No. 121, Air Brake Systems, formerly required trucks and trailers to comply with certain stopping distances and other road test requirements. To achieve these requirements, trucks and trailers were equipped with front axle brakes which aid significantly in improving vehicle stopping capability. However, in *PACCAR v. NHTSA*, 573 F.2d, 632 (9th Cir. 1978) *cert. den'd* 439 U.S. 862, the road test requirements were invalidated as they apply to trucks and trailers. In light of this development, several manufacturers tentatively decided to remove front axle brakes as a way to reduce slightly the costs associated with the production of heavy duty vehicles.

When the agency discovered that manufacturers intended to remove front axle brakes, the NHTSA reexamined data available to it concerning the effect that such a removal of brakes would have upon the capability of these vehicles to make safe stops. The results of this examination, which were detailed in the proposal and which are available in the docket, lead the agency to conclude that the removal of front axle brakes increases a vehicle's stopping distance. The amount of this increase depends upon the type of vehicle, the vehicle loading and the effectiveness of its remaining brake systems. Sometimes the increase in stopping distances is substantial.

The agency considers any increase in the stopping distance of heavy vehicles to be contrary to the interests of safety. Existing heavy duty vehicles equipped with front axle brakes already have longer stopping distances than many smaller vehicles on the road. This disparity in the stopping distances between large and small vehicles increases the likelihood of accidents between vehicles when both are involved in emergency braking maneuvers. To permit a reduction in the braking capabilities of heavy vehicles, that would

result in exacerbating the disparity between the stopping distances of heavy and lighter vehicles, could result in an increased risk of accidents to the occupants of both vehicle groups. To prevent the downgrading of heavy vehicle brake systems, the agency issued its notice of proposed rulemaking to require brakes acting on all wheels.

Sixteen comments were received in response to the notice of proposed rulemaking. Most of the commenters concurred with the agency's attempt to prevent the downgrading of heavy duty vehicle brake systems. However, many of the commenters raised minor objections to the manner in which the proposed action was to be taken.

The largest single complaint from the commenters concerning the proposal was that it would implement only a small portion of a new safety standard. Many commenters suggested that the agency should not implement any part of that standard (Standard No. 130) until all research has been completed and the agency is prepared to issue the standard in its entirety. In connection with this comment, several manufacturers suggested that the proposed amendment would be more appropriately placed in Standard No. 121.

Manufacturers argued the merits of amending Standard No. 121 rather than implementing Standard No. 130 in several ways. First, they argued that by implementing Standard No. 130 in a piecemeal fashion, the agency is subjecting itself to many of the criticisms that have surrounded Standard No. 121. Therefore, they suggested that the agency defer action on Standard No. 130 until a complete standard can be issued. Further, they stated that the implementation of a new safety standard would increase paperwork and would require changes in certification labels and incomplete vehicle documents. They suggest these changes would add costs and would require extending the leadtime before the proposed requirement could become effective. On the other hand, manufacturers stated that an amendment of Standard No. 121 would not require them to change certification labels or modify incomplete vehicle documents. This would lower the costs associated with the proposal. Also, the leadtime for implementing a change in Standard No. 121 would be minimal.

In response to the manufacturers first argument that no portion of Standard No. 130 should be implemented until the entire standard is ready for issuance, the agency disagrees. Currently, the

NHTSA is conducting several research programs concerning heavy duty vehicle brakes. Some of this rulemaking is long-term while some is short-term. The agency contemplates implementation of some portions of the short-term rulemaking actions prior to obtaining information on all of its long-term rulemaking goals. This is the typical rulemaking process for many of the agency's standards. It is not in the interest of safety to defer short-term safety gains while waiting for the results of long-term safety rulemaking.

The agency is more persuaded by the manufacturers's second argument that implementation of a portion of Standard No. 130 at this time would unnecessarily impose additional paperwork burdens upon manufacturers, whereas amending Standard No. 121 to accomplish the same result would not increase their paperwork burdens. As the NHTSA indicated in the notice proposing this amendment, the agency seeks only to maintain the existing quality of braking systems. Whether this goal is achieved by amending Standard No. 121 or implementing part of Standard No. 130 is not important to the agency. However, since manufacturers would prefer amending Standard No. 121 and since implementing part of Standard No. 130 would be more costly, the agency agrees with those commenters who would prefer an amendment of Standard No. 121, and that standard is amended by this notice. Several commenters objected to the proposal on the grounds that it was a design standard rather than a performance standard. These commenters suggested that the agency should delay amendments implementing any requirements until the correct performance requirements are developed. The agency disagrees.

All of the agency's safety standards affect design choices to some degree. The very setting of any performance standard implies some narrowing of design choice. Although the agency attempts to minimize the effect, in some instances a significant limitation on design is necessary to secure a particular type of safety improvement. Standard No. 121 does not differ from other safety standards in its effect on design. It uses performance requirements although some elements of design are restricted. Even though this amendment increases slightly the standard's effect on design choice, the standard remains performance oriented. Further, the effect of the old standard was to require brakes acting on all wheels. Although this amendment is



more specific in that requirement, the result is the same. Commenters should note that the agency is not specifying the design of the brakes that must be used on each wheel. Accordingly, the NHTSA concludes that this amendment does not substantially or unnecessarily affect design and allows manufacturers significant flexibility in the design and improvement of their braking systems.

As a result of the *PACCAR* decision and the resulting possibility of brake performance downgrading, the agency is forced to take immediate corrective action. The *PACCAR* decision raised questions concerning the stopping distance requirements for trucks and trailers. The Court urged the agency to reexamine its stopping distance requirements and to ensure the propriety of any requirement that might be reimposed. In response, the agency has commenced exploratory rulemaking to determine the appropriate stopping distances for trucks and trailers. When the rulemaking is completed, it is contemplated that stopping distance requirements will be reimposed. The agency cannot reimpose those requirements until the research is completed. Given the absence of stopping distance requirements for trucks and trailers, and the time required for reimplementing stopping distances and the immediate problem of brake system downgrading, the agency must adopt a more expedient approach to prevent the existing levels of safety in heavy-duty vehicle brakes from being reduced.

Kelsey-Hayes supported this rulemaking action but at the same time requested an interpretation of an entirely unrelated section of Standard No. 121. Unrelated requests for interpretations should not be included with docket comments on a specific proposal. The agency will, however, respond to Kelsey-Hayes by a letter or in a separate notice.

In accordance with Executive Order 12044, the agency has reviewed the impacts of this proposed amendment and has determined that it is not significant. Since the amendment will merely require manufacturers to continue to manufacture vehicles as they are doing currently, the costs associated with this amendment will be minimal. Further, the agency has adopted the manufacturers' suggestions to incorporate this amendment in Standard No. 121 to further minimize the possibility of any increased costs.

Since this amendment imposed no additional burdens upon any manufacturer and only requires manufacturers to continue existing manufacturing practices and since it is in the interest of safety to prohibit as soon as possible the manufacture of vehicles without front axle brakes, the amendment is effective 45 days after publication in the Federal Register. In the notice proposing this amendment, commenters objected to an immediate effective date especially if the amendment were made in Standard No. 130. Commenters indicated that more time would be required to change certification labels. Since the amendment is being incorporated into the existing Standard No. 121, the agency considers these objections to the effective date to be no longer valid. Nonetheless, the agency is giving 45 days of leadtime to ensure that all manufacturers have ample time to comply with the requirements.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations, Part 571 is amended by revising Standard No. 121, Air Brake Systems, as follows:

1. A new paragraph S5.1.8 is added to 49 CFR Part 571.121 to read:

S5.1.8 Brake distribution. Each vehicle shall be equipped with a service brake system acting on all wheels.

2. A new paragraph S5.2.2 is added to 49 CFR Part 571.121 to read:

S5.2.2 Brake distribution. Each trailer shall be equipped with a service brake system acting on all wheels.

The principal authors of this notice are John Machey of the Crash Avoidance Division and Roger Tilton of the Office of Chief Counsel.

Issued on June 2, 1980.

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Joan Claybrook  
Administrator

45 FR 38380  
June 9, 1980



## MOTOR VEHICLE SAFETY STANDARD NO. 121

### Air Brake Systems—Trucks, Buses and Trailers

(Docket Nos. 70-16, 70-17; Notice No. 2)

**S1. Scope.** This standard establishes performance and equipment requirements for braking systems on vehicles equipped with air brake systems.

**S2. Purpose.** The purpose of this standard is to insure safe braking performance under normal and emergency conditions.

**S3. Application.** This standard applies to trucks, buses, and trailers equipped with air brake systems. However, it does not apply to:

(a) Any vehicle that has an overall vehicle width of more than 102 inches with extendable equipment in the fully retracted position;

(b) Any vehicle equipped with an axle that has a gross axle weight rating (GAWR) of 29,000 pounds or more;

(c) Any truck or bus that has a speed attainable in 2 miles of not more than 33 mph;

(d) Any truck that has a speed attainable in 2 miles of not more than 45 mph, an unloaded vehicle weight that is not less than 95 percent of its GVWR, and no capacity to carry occupants other than the driver and operating crew;

(e) Any trailer that has a gross vehicle weight rating GVWR of more than 120,000 pounds and whose body conforms to that described in the definition of "Heavy hauler trailer" set forth in S4;

(f) Any trailer that has an unloaded vehicle weight which is not less than 95 percent of its GVWR; and

(g) Any load divider dolly.

In addition, the standard does not apply to a heavy hauler trailer manufactured before January 1, 1979; any vehicle manufactured before January 1, 1979, that, in combination with

another vehicle, constitutes a part of an auto transporter; and any vehicle manufactured before September 1, 1977, that has a GAWR for any axle of 24,000 pounds or more, or two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle.

#### S4. Definitions.

"Air brake system" means a system that uses air as a medium for transmitting pressure or force from the driver control to the service brake, but does not include a system that uses compressed air or vacuum only to assist the driver in applying muscular force to hydraulic or mechanical components.

"Antilock system" means a portion of a service brake system that automatically controls the degree of rotational wheel slip at one or more road wheels of the vehicle during braking.

"Auto transporter" means a truck and a trailer designed for use in combination to transport motor vehicles, in that the towing vehicle is designed to carry cargo at a location other than the fifth wheel and to load this cargo only by means of the towed vehicle.

"Heavy hauler trailer" means a trailer with one or more of the following characteristics:

(1) Its brake lines are designed to adapt to separation or extension of the vehicle frame; or

(2) Its body consists only of a platform whose primary cargo-carrying surface is not more than 40 inches above the ground in an unloaded condition, except that it may include sides that are designed to be easily removable and a permanent "front-end structure" as that term is used in § 393.106 of this title.



“Initial brake temperature” means the average temperature of the service brakes on the hottest axle of the vehicle 0.2 miles before any brake application.

“Load divider dolly” means a trailer composed of a trailer chassis and one or more axles, with no solid bed, body, or container attached, and which is designed exclusively to support a portion of the load on a trailer or truck excluded from all the requirements of this standard.

“Skid number” means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials Method “E-274-70 (as revised July 1974)” at 40 mph, omitting water delivery as specified in paragraphs S7.1 and 7.2” of that method.

“Speed attainable in two miles” means the speed attainable by accelerating at maximum rate from a standing start for two miles on a level surface.

**S5. Requirements.** Each vehicle shall meet the following requirements under the conditions specified in S6.

**S5.1 Required equipment—trucks and buses.** Each truck and bus shall have the following equipment:

**S5.1.1 Air Compressor.** An air compressor of sufficient capacity to increase air pressure in the supply and service reservoirs from 85 pounds per square inch (psi) to 100 (psi) when the engine is operating at the vehicle manufacturer’s maximum recommended rpm within a time, in seconds, determined by the quotient

$$\frac{\text{actual reservoir capacity} \times 25}{\text{required reservoir capacity}}$$

**S5.1.2 Reservoirs.** One or more service reservoir systems, from which air is delivered to the brake chambers, and either an automatic condensate drain valve for each service reservoir or a supply reservoir between the service reservoir system and the source of air pressure.

**S5.1.2.1** The combined volume of all service reservoirs and supply reservoirs shall be at least twelve times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms.

**S5.1.2.2** Each reservoir shall be capable of withstanding an internal hydrostatic pressure of five times the compressor cutout pressure or 500 p.s.i., whichever is greater for 10 minutes.

**S5.1.2.3** Each service reservoir system shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and the source of air pressure, by check valves or equivalent devices whose proper functioning can be checked without disconnecting any air line or fitting.

**S5.1.2.4** Each reservoir shall have condensate drain valve that can be manually operated.

**S5.1.2.3 Towing vehicle protection system.** If the vehicle is intended to tow another vehicle equipped with air brakes, a system to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle.

**S5.1.4 Pressure gauge.** A pressure gauge in each service brake system, readily visible to a person seated in the normal driving position, that indicates the service reservoir system air pressure. The accuracy of the gauge shall be within plus or minus 7 percent of the compressor cut-out pressure.

**S5.1.5 Warning signal.** A signal, other than a pressure gauge, that gives a continuous warning to a person in the normal driving position when the ignition is in the “on” or “run” position and the air pressure in the service reservoir system is below 60 psi. The signal shall be either visible within the driver’s forward field of view, or both audible and visible.

**S5.1.6 Antilock warning signal.** A signal on each vehicle equipped with an antilock system that gives a continuous warning to a person in the normal driving position when the ignition is in the “on” or “run” position in the event of a total electrical failure of the antilock system. The signal shall be either visible within the driver’s forward field of view or both audible, for a duration of at least 10 seconds, and continuously visible. The signal shall operate in the specified manner each time the ignition is returned to the “on” or “run” position.

**S5.1.7 Service brake stop lamp switch.** A switch that lights the stop lamps when the service

brake control is statically depressed to a point that produces a pressure of 6 psi or less in the service brake chambers.

**S5.1.8 Brake distribution.** Each vehicle shall be equipped with a service brake system acting on all wheels.

**S5.2 Required equipment—trailers.** Each trailer shall have the following equipment:

**S5.2.1 Reservoirs.** One or more reservoirs to which the air is delivered from the towing vehicle.

**S5.2.1.1** A reservoir shall be provided that is capable, when pressurized to 90 psi, of releasing the vehicle's parking brakes at least once and that is unaffected by a loss of air pressure in the service brake system.

**S5.2.1.2** Total service reservoir volume shall be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms.

**S5.2.1.3** Each reservoir shall be capable of withstanding an internal hydrostatic pressure of 500 p.s.i. for 10 minutes.

**S5.2.1.4** Each reservoir shall have a condensate drain valve that can be manually operated.

**S5.2.1.5** Each service reservoir shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and its source of air pressure by check valves or equivalent devices.

**S5.2.2 Brake distribution.** Each trailer shall be equipped with a service brake system acting on all wheels.

**S5.3 Service brakes—road tests.** The service brake system on each truck and bus shall, under the conditions of S6.1, meet the requirements of S5.3.1, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. The service brake system on each trailer shall, under the conditions of S6.1, meet the requirements of S5.3.2, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. However, the truck and trailer portions of an auto transporter (if both are manufactured after January 1, 1979) shall, in combination, meet the requirements of S5.3.1 as they apply to a single unit truck or bus, in place of the requirements of S5.3.2 as they apply to the trailer portion, and in place of the re-

quirements of S5.3.1 as they apply to the truck portion in the loaded condition.

**S5.3.1 Stopping distance—trucks and buses.**

Except for a school bus when stopped six times for each combination of weight, speed, and road condition specified in S5.3.1.1, in the sequence specified in Table I, the vehicle shall stop at least once in not more than the distance specified in Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway and without lockup of any wheel at speeds above 10 mph except for

(a) Controlled lockup of wheels of not more than one second allowed by an antilock system, or

(b) Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable, nonsteerable axles on a vehicle with more than two nonsteerable axis.

TABLE I  
STOPPING SEQUENCE

1. Burnish
2. Control trailer service brake stops at 60 mph (for truck-tractors tested with a control trailer in accordance with S6.1.10.6).
3. Control trailer emergency brake stops at 60 mph (for truck-tractors tested with a control trailer in accordance with S6.1.10.7).
4. Stops with vehicle at gross vehicle weight rating:
  - (a) 20 mph service brake stops on skid number range 71-81.
  - (b) 60 mph service brake stops on skid number range 71-81.
  - (c) 20 mph service brake stops on skid number range 20-30.
  - (d) 20 mph emergency brake stops on skid number range 71-81.
  - (e) 60 mph emergency brake stops on skid number range 71-81.
5. Parking brake test with vehicle loaded to gross vehicle weight rating.
6. Stops with vehicle at unloaded weight plus 500 lb.:
  - (a) 20 mph service brake stops on skid number range 71-81.



- (b) 60 mph service brake stops on skid number range 71-81.
  - (c) 20 mph service brake stops on skid number range 20-30.
  - (d) 20 mph emergency brake stops on skid number range 71-81.
  - (e) 60 mph emergency brake stops on skid number range 71-81.
7. Parking brake test with vehicle at unloaded weight plus 500 lb.

**S5.3.1.1** Stop the vehicle from 60 m.p.h. and 20 mph on a surface with a skid number in the range of 71 to 81, and from 20 mph on a wet surface with a skid number in the range of 20 to 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation). If the speed attainable in 2 miles is less than 60 mph, the vehicle shall stop from a speed in Table II that is 4 to 8 mph less than the speed attainable in 2 miles.

TABLE II.—Stopping Distance in Feet

Vehicle speed in miles per hour	Service Brake stopping distance		Emergency Brake stopping distance	
	Column 1 Skid No. 71-81	Column 2 Skid No. 20-20	Column 3 Skid No. 71-81	Column 4
20	35	60	83	85
25	53		123	131
30	75		170	186
35	101		225	250
40	131		288	325
45	165		358	409
50	203		435	504
55	246		520	608
60	293		613	720

**S5.3.2. Stopping capability—trailers.** When tested at each combination of weight, speed, and road condition specified in S5.3.2.1, in the sequence specified in Table I, with air pressure of 90 psi in the control line and service reservoir system and with no application of the towing vehicle's brakes, a trailer shall stop without any part of the trailer leaving the roadway and with-

out lockup of any wheel at speeds above 10 mph, except for

- (a) Controlled lockup of wheels of not more than one second allowed by an antilock system; or
- (b) Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable; nonsteerable axles on a trailer with more than two nonsteerable axles; or
- (c) In the case of an axle system having more than four wheels, lockup of any wheel other than the outermost wheel at each end of the axle system.

**S5.3.2.1** Stop the vehicle from 60 m.p.h. and 20 mph on a surface with skid number in the range of 71 to 81, and from 20 mph on a wet surface with a skid number in the range of 20 to 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including instrumentation).

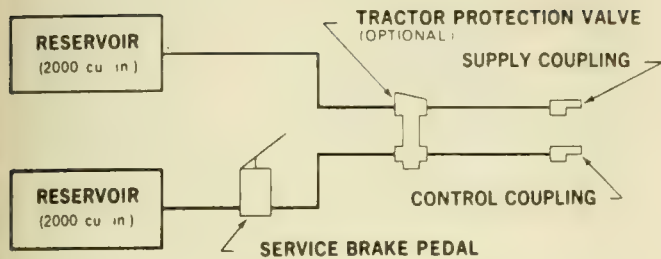
**S5.3.2.2** When stopped in accordance with S5.3.2., any trailer designed exclusively for harvesting logs or pulpwood and constructed with a skeletal frame with no means for attachment of a solid bed, body, or container, and with an arrangement of air control lines and reservoirs designed to minimize damage in off-road operations, need not meet the requirements relating to wheel lockup, but must nevertheless meet the requirements of staying within the 12-foot lane.

**S5.3.3 Brake actuation time.** With an initial service reservoir system air pressure of 100 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, reach 60 psi in not more than 0.45 seconds in the case of trucks and buses, 0.35 seconds in the case of trailer converter dollies, and 0.30 seconds in the case of trailers other than trailer converter dollies. A vehicle designed to tow a vehicle equipped with air brakes shall be capable of meeting the above actuation time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above actuation time requirement with its brake system connected to the test rig shown in Figure 1.



FIGURE 1

TRAILER TEST RIG



**S5.3.4 Brake release time.** With an initial service brake chamber air pressure of 95 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, fall to 5 psi in not more than 0.55 seconds in the case of trucks and buses, and fall to 5 psi in not more than 0.65 seconds in the case of trailers, including trailer converter dollies. A vehicle designed to tow another vehicle equipped with air brakes shall be capable of meeting the above release time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above release time requirements with its brake system connected to the test rig shown in Figure 1.

**S5.4 Service brake system—dynamometer tests.**

When tested without prior road testing, under the conditions of S6.2, each brake assembly shall meet the requirements of S5.4.1, S5.4.2, and S5.4.3 when tested in sequence and without adjustments other than those specified in the standard. For purposes of the requirements of S5.4.2 and S5.4.3, an average deceleration rate is the change in velocity divided by the deceleration time measured from the onset of deceleration.

**S5.4.1 Brake retardation force.** The sum of the retardation forces exerted by the brakes on each vehicle designed to be towed by another vehicle equipped with air brakes shall be such that the quotient

$$\frac{\text{sum of the brake retardation forces}}{\text{sum of GAWRs}}$$

relative to brake chamber air pressure shall have values not less than those shown in Column 1 of Table III. Retardation force shall be determined as follows:

TABLE III  
BRAKE RETARDATION FORCE

BRAKE RETARDATION FORCE GAWR Column 1	BRAKE CHAMBER PRESSURE, p.s.i. Column 2
0.05	20
0.12	30
0.18	40
0.25	50
0.31	60
0.37	70
0.41	80

**S5.4.1.1** After burnishing the brake pursuant to S6.2.6, retain the brake assembly on the inertia dynamometer. With an initial brake temperature between 125°F and 200°F, conduct a stop from 50 mph, maintaining brake chamber air pressure at a constant 20 psi. Measure the average torque exerted by the brake from the time the specified air pressure is reached until the brake stops and divide by the static loaded tire radius specified by the tire manufacturer to determine the retardation force. Repeat the procedure six times, increasing the brake chamber air pressure by 10. After each stop, rotate the brake drum or disc until the temperature of the brake falls to between 125°F and 200°F.

**S5.4.2 Brake power.** When mounted on an inertia dynamometer, each brake shall be capable of making 10 consecutive decelerations at an average rate of 9 fpsps from 50 mph to 15 mph, at equal intervals of 72 seconds, and shall be capable of decelerating to a stop from 20 mph at an average deceleration rate of 14 fpsps one minute after the 10th acceleration. The series of decelerations shall be conducted as follows:

**S5.4.2.1** With an initial brake temperature between 150°F and 200°F for the first brake application, and the drum or disc rotating at a speed equivalent to 50 mph, apply the brake and

decelerate at an average deceleration rate of 9 fpsps to 15 mph. Upon reaching 15 mph, accelerate to 50 mph and apply the brake for a second time 72 seconds after the start of the first application. Repeat the cycle until 10 decelerations have been made. The service line air pressure shall not exceed 100 psi during any deceleration.

**S5.4.2.2** One minute after the end of the last deceleration required by S5.4.2.1 and with the drum or disc rotating at a speed of 20 mph, decelerate to a stop at an average deceleration rate of 14 fpsps. The service brake line air pressure shall not exceed 108 psi.

**S5.4.3 Brake recovery.** Starting 2 minutes after completing the tests required by S5.4.2, the brake of a vehicle other than either front axle brake of a truck-tractor shall be capable of making 20 consecutive stops from 30 mph at an average deceleration rate of 12 ft/s/s, at equal intervals of 1 minute measured from the start of each brake application. The service line air pressure needed to attain a rate of 12 ft/s/s shall be not more than 75 lb./in.<sup>2</sup>, and not less than 20 lb./in.<sup>2</sup> for a brake not subject to the control of an antilock system, or 12 lb./in.<sup>2</sup> for a brake subject to the control of an antilock system.

## **S5.5 Antilock system.**

**S5.5.1 Antilock system failure.** On a vehicle equipped with an antilock system, electrical failure of any part of the antilock system shall not increase the actuation and release times of the service brakes.

**S5.5.2 Antilock system power—trailers.** On a trailer equipped with an antilock system that requires electrical power for operation, the power shall be obtained from the stop lamp circuit. Additional circuits may also be used to obtain redundant sources of electrical power.

**S5.6 Parking brake system.** Each vehicle other than a trailer converter dolly shall have a parking brake system that under the conditions of S6.1 meets the requirements of S5.6.1 or S5.6.2, at the manufacturer's option, and the requirements of S5.6.3 and S5.6.4. However, a trailer that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evi-

denced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations, shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 393.43 of the title.

**S5.6.1 Static retardation force.** With all other brakes rendered inoperative, during a static drawbar pull in a forward or rearward direction, the static retardation force produced by the application of the parking brakes shall be:

(a) In the case of a vehicle other than a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

is not less than 0.28 for any axle other than a steerable front axle; and

(b) In the case of a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GVWR}}$$

is not less than 0.14.

**S5.6.2 Grade holding.** With all parking brakes applied, the vehicle shall remain stationary facing uphill and facing downhill on a smooth, dry portland cement concrete roadway with a 20% grade, both (a) when loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation).

**S5.6.3 Application and holding.** The parking brakes shall be applied by an energy source that is not affected by loss of air pressure or brake fluid pressure in the service brake system. Once applied, the parking brakes shall be held in the applied position solely by mechanical means.

**S5.6.4 Parking brake control—trucks and buses.** The parking brake control shall be separate from the service brake control. It shall be operable by a person seated in the normal driving position. The control shall be identified in a manner that specifies the method of control operation.



The parking brake control shall control the parking brakes of the vehicle and of any air braked vehicle that it is designed to tow.

**S5.7 Emergency brake system—trucks and buses.** Each vehicle shall be equipped with an emergency brake system which, under the conditions of S6.1, conforms to the requirements of S5.7.1 through S5.7.3. The emergency brake system may be a part of the service brake system or incorporate portions of the service brake and parking brake systems.

**S5.7.1 Emergency brake system performance.** When stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 75, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in Column 3 of Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

**S5.7.1.1 Automatic application.** The parking brakes shall be automatically applied and the supply line to any towed vehicle vented to atmospheric pressure when the air pressure in all service reservoirs is less than the automatic application pressure level. The automatic application pressure level shall be between 20 and 45 p.s.i.

**S5.7.1.2 Automatic braking performance.** With the parking brake automatically applied, a vehicle shall either be capable of meeting the requirements of S5.7.2.3, with distances measured from the point of automatic application, or shall have a static retardation force quotient not greater than 0.40 for any axle, determined in accordance with S5.6.1.

**S5.7.1.3 Release after automatic application.** After automatic application, the parking brakes shall be releasable at least once by means of a parking control. The parking brakes shall be

releasable only if they can be automatically re-applied and exert the force required by S5.6 immediately after release.

**S5.7.1.4 Manual operation.** The parking brakes shall be manually operable and releasable when the air pressure in the service reservoir system is sufficient to keep the parking brakes from automatically applying.

**S5.7.2 Emergency brake system operation.** The emergency brake system shall be applied and released, and be capable of modulation, by means of the service brake control.

**S5.7.2.1 Emergency braking control.** The emergency braking system shall be controlled by the service brake control or the parking brake control. The control for the emergency braking system shall control the brakes on any towed vehicle equipped with air brakes.

**S5.7.2.2 Emergency braking system failure.** In the event of a failure of a valve, manifold, brake fluid housing, or brake chamber housing that is common to the service brake and emergency braking systems, loss of air shall not cause the parking brake to be inoperable.

**S5.7.2.3 Emergency braking stopping distance.** Except as specified in S5.7.2.3.1 and S5.7.2.3.2, when stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 75, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold, brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in column 3 of Table II, measured from the point at which movement of the brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

**S5.7.2.3.1** A truck manufactured before September 1, 1976, that has a front steerable non-driving axle with a GAWR of 16,000 pounds or more, or a front steerable drive axle with a GAWR of less than 18,000 pounds, and a truck



manufactured before September 1, 1975, that has a front steerable drive axle of any GAWR, must stop in accordance with S5.7.2.3 without any part of the vehicle leaving the roadway, but need not stop in the distances specified.

**S5.7.2.3.2** When stopped in accordance with S5.7.2.3, a truck or bus manufactured before September 1, 1975, other than a truck described in S5.7.2.3.1, shall stop at least once for each speed and weight condition on a surface with a skid number of 75 in not more than the distance specified in Table IIa instead of meeting the stopping distances specified in Table II for stops on a surface with a skid number of 75.

**S5.7.3 Towing vehicle emergency brake requirements.** In addition to meeting the other requirements of S5.7, a vehicle designed to tow another vehicle equipped with air brakes shall—

(a) In the case of a truck-tractor in the unloaded condition and a single unit truck which is capable of towing an air-brake equipped vehicle and is loaded to gross vehicle weight rating, be capable of meeting the requirements of S5.7.1 by operation of the service brake control only, with the trailer air supply line and air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14;

(b) In the case of a truck-tractor loaded to gross vehicle weight rating, be capable of meeting S5.7.1 by operation of the service brake control only, with the air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14; and

(c) Be capable of modulating the air in the supply or control line to the trailer by means of the service brake control with a single failure in the towing vehicle service brake system as specified in S5.7.1.

**S5.8 Emergency braking capability—trailers.** Each trailer other than a trailer converter dolly shall have a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure. A trailer converter dolly shall have, at the manufacturer's option, (a) a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the

supply line is at atmospheric pressure, or (b) an emergency system that automatically controls the service brakes when the service reservoir is at any pressure above 20 lb./in.<sup>2</sup> and the supply line is at atmospheric pressure. However, a trailer that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evidenced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations, shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 393.43 of this title.

**S6 Conditions.** The requirements of S5 shall be met under the following conditions. Except as otherwise specified, where a range of conditions is specified, the vehicle must be capable of meeting the requirements at all points within the range.

**S6.1 Road test conditions.**

**S6.1.1** Except as otherwise specified, the vehicle is loaded to its gross vehicle weight rating, distributed proportionally to its gross axle weight ratings.

**S6.1.2** The inflation pressure is as specified by the vehicle manufacturer for the gross vehicle weight rating.

**S6.1.3** Unless otherwise specified, the transmission selector control is in neutral or the clutch is disengaged during all decelerations and during static parking brake tests.

**S6.1.4** All vehicle openings (doors, windows, hood, trunk, cargo doors, etc.) are in a closed position except as required for instrumentation purposes.

**S6.1.5** The ambient temperature is between 32°F and 100°F.

**S6.1.6** The wind velocity is zero.

**S6.1.7** Unless otherwise specified, stopping tests are conducted on a 122-foot wide, level, straight roadway having a skid number in the range of 71 to 81, inclusive, chosen at the option of the manufacturer. The vehicle is aligned in

the center of the roadway at the beginning of the stop.

**S6.1.8** The brakes are burnished before testing in accordance with S6.1.8.1. However, for vehicles with parking brake systems not utilizing the service brake friction elements, burnish the friction elements of such systems prior to the parking brake test according to the manufacturer's recommendations.

**S6.1.8.1** With the transmission in the highest gear appropriate for the series given in Table IV make 500 brake applications at a deceleration rate of 10 ft/s/s, or at the vehicle's maximum deceleration rate, if not less than 10 ft/s/s, in the sequence specified in Table IV. After each brake application, accelerate to the speed specified

Table IV

Series	Snubs	Snub conditions (highest speed specified)
1	175	40 to 20 mph.
2	25	45 to 20 mph.
3	25	50 to 20 mph.
4	25	55 to 20 mph.
5	250	60 to 20 mph.

and maintain that speed until making the next brake application at a point 1 mile from the initial point of the previous brake application. If a vehicle cannot attain the specified speed in 1 mile, continue to accelerate until the specified speed is reached or until the vehicle has traveled 1.5 miles from the initial point of the previous brake application. If during any of the brake applications specified in Table IV, the hottest brake reaches 500° F, make the remainder of the 500 applications from that snub condition except that a higher or lower snub condition shall be used as necessary to maintain an after-stop temperature of 500° F ± 50° F. Any automatic pressure limiting valve is in use to limit pressure as designed, except that any automatic front axle pressure limiting valve is bypassed if the temperature of the hottest brake on a rear axle exceeds the temperature of the hottest brake on a front axle by more than 125° F. A bypassed valve is reconnected if the temperature of the hottest brake on a front axle exceeds the temperature of the hottest brake on a rear axle by

100° F. After burnishing, adjust the brakes as recommended by the vehicle manufacturer.

**S6.1.9** Static parking brake tests for a semi-trailer are conducted with the front end supported by an unbraked dolly. The weight of the dolly is included as part of the trailer load.

**S6.1.10** In a test other than a static parking brake test, truck-tractor is tested at its gross vehicle weight rating by coupling it to a flatbed semitrailer (hereafter, control trailer) as specified in S6.1.10.1 to S6.1.10.7.

**S6.1.10.1** The control trailer conforms to this standard.

**S6.1.10.2** The center of gravity of the loaded control trailer is on the trailer's longitudinal centerline at a height of 66 ± 3 in. above the ground.

**S6.1.10.3** For a truck-tractor with a rear axle gross axle weight rating of 26,000 lb or less, the control trailer has a single axle with a gross axle weight rating of 18,000 lb and a length, measured from the transverse centerline of the axle to the centerline of the kingpin, of 258 ± 6 in.

**S6.1.10.4** For a truck-tractor with a total rear axle gross axle weight rating of more than 26,000 lb the control trailer has a tandem axle with a combined gross axle weight rating of 32,000 lb and a length, measured from the transverse centerline between the axles to the centerline of the kingpin, of 390 ± 6 in.

**S6.1.10.5** The control trailer is loaded so that its axle is loaded to its gross axle weight rating and the tractor is loaded to its gross vehicle weight rating, with the tractor's fifth wheel adjusted so that the load on each axle measured at the tire-ground interface is most nearly proportional to the axles' respective gross axle weight ratings.

**S6.1.10.6 Test equipment specification.** The control trailer's service brakes are capable of stopping the combination from the maximum, speed at which the tractor is tested, under the conditions of S6.1, without assistance from the tractor brakes, in the distance found by multiplying the value 68, 90, 115, 143, 174, 208, or 245 (corresponding to a speed of 30, 35, 40, 45, 50,



55, or 60 mph as appropriate for the truck-tractor tested) by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the tractor's fifth wheel adjusted as specified in S6.1.10.5, the trailer service reservoirs pressurized to 100 lb./in.<sup>2</sup>, and the trailer loaded so that its axle is at gross axle weight rating and its kingpin is at empty vehicle weight. The stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. The service brake chambers on the trailer reach 60 lb./in.<sup>2</sup> in not less than 0.20 second and not more than 0.30 second, measured from the instant at which movement of the valve controlling the trailer brakes begins.

**S6.1.10.7 Test equipment specification.** The control trailer's emergency brakes are capable of stopping the combination under the conditions of S6.1 from the maximum speed at which the tractor is tested, without assistance from the tractor's brakes, in the distance found by multiplying the emergency brake stopping distance in column 3 of Table II by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the combination loaded in accordance with S6.1.10.5. Stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. In the case of control trailers that utilize parking brakes for emergency stopping capability, the pressure in the trailer's spring parking brake chambers falls from 95 lb./in.<sup>2</sup> to 5 lb./in.<sup>2</sup> in not less than 0.50 second and not more than 0.60 second, measured from the instant at which movement of the valve controlling the trailer's spring parking brakes begins.

**S6.1.11 Special drive conditions.** A vehicle equipped with an interlocking axle system of a front wheel drive system that is engaged and disengaged by the driver is tested with the system disengaged.

**S6.1.1.12 Lifiable axles.** A vehicle with a liftable axle is tested at gross vehicle weight rating with the liftable axle down and at unloaded vehicle weight with the liftable axle up.

**[S6.1.13** The trailer test rig shown in Figure 1 is capable of increasing the pressure in a 50 cubic inch reservoir from atmospheric to 60 lb./in.<sup>2</sup> in 0.06 second, measured from the first movement of the service brake control to apply service brake pressure and of releasing pressure in such a reservoir from 95 to 5 lb./in.<sup>2</sup> in 0.22 second measured from the first movement of the service brake control to release service brake pressure.

**S6.1.14** In testing the emergency braking system of towing vehicles under S5.7.3(a) and S5.7.3(b) the hose(s) is vented to the atmosphere at any time not less than 1 second and not more than 1 minute before the emergency stop begins, while the vehicle is moving at the speed from which the stop is to be made and any manual control for the towing vehicle protection system is in the position to supply air and brake control signals to the vehicle being towed. No brake application is made from the time the line(s) is vented until the emergency stop begins and no manual operation of the parking brake system or towing vehicle protection system occurs from the time the line(s) is vented until the stop is completed.

**S6.1.15 Initial brake temperature.** The temperature of each brake is measured by a single plug-type thermocouple installed in the center of the lining surface of the most heavily loaded shoe or pad as shown in Figure 2. The thermocouple is outside any center groove. With the exception of conditions specified for burnishing brakes in paragraph S6.1.8, repetitive test runs are separated by an interval of time sufficient to reach any initial brake temperature in the range of 150°F to 200°F. If the initial brake temperature for the first stop in a test procedure has not been reached, heat the brakes to the initial brake temperature by making not more than 10 snubs from not more than 40 to 10 mph at a deceleration not greater than 10 fpsps.

## **S6.2 Dynamometer test conditions.**

**S6.2.1** The dynamometer inertia for each wheel is equivalent to the load on the wheel with the axle loaded to its gross axle weight rating.

**S6.2.2** The ambient temperature is between 75°F and 100°F.



**S6.2.3** Air at ambient temperature is directed uniformly and continuously over the brake drum or disc at a velocity of 2,200 feet per minute.

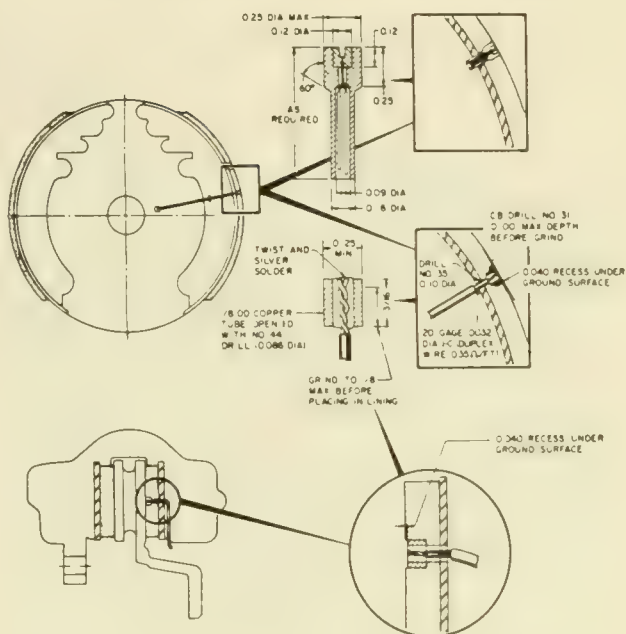
**S6.2.4** The temperature of each brake is measured by a single plus type thermocouple installed in the center of the lining surface of the most heavily loaded shoe or pad as shown in Figure II. The thermocouple is outside any center groove.

**S6.2.5** The rate of brake drum or disc rotation on a dynamometer corresponding to the rate of rotation on a vehicle at a given speed is calculated by assuming a tire radius equal to the static loaded radius specified by the tire manufacturer.

**S6.2.6** Brakes are burnished before testing as follows: Place the brake assembly on an inertia dynamometer and adjust the brake as recommended by the brake manufacturer. Make 200 stops from 40 mph at a deceleration of 10 fpsps, with an initial brake temperature on each stop of not less than 315°F and not more than 385°F. Make 200 additional stops from 40 mph at a deceleration of 10 fpsps with an initial brake temperature on each stop of not less than 450°F and not more than 550°F. After burnishing, the brakes are adjusted as recommended by the brake manufacturer.

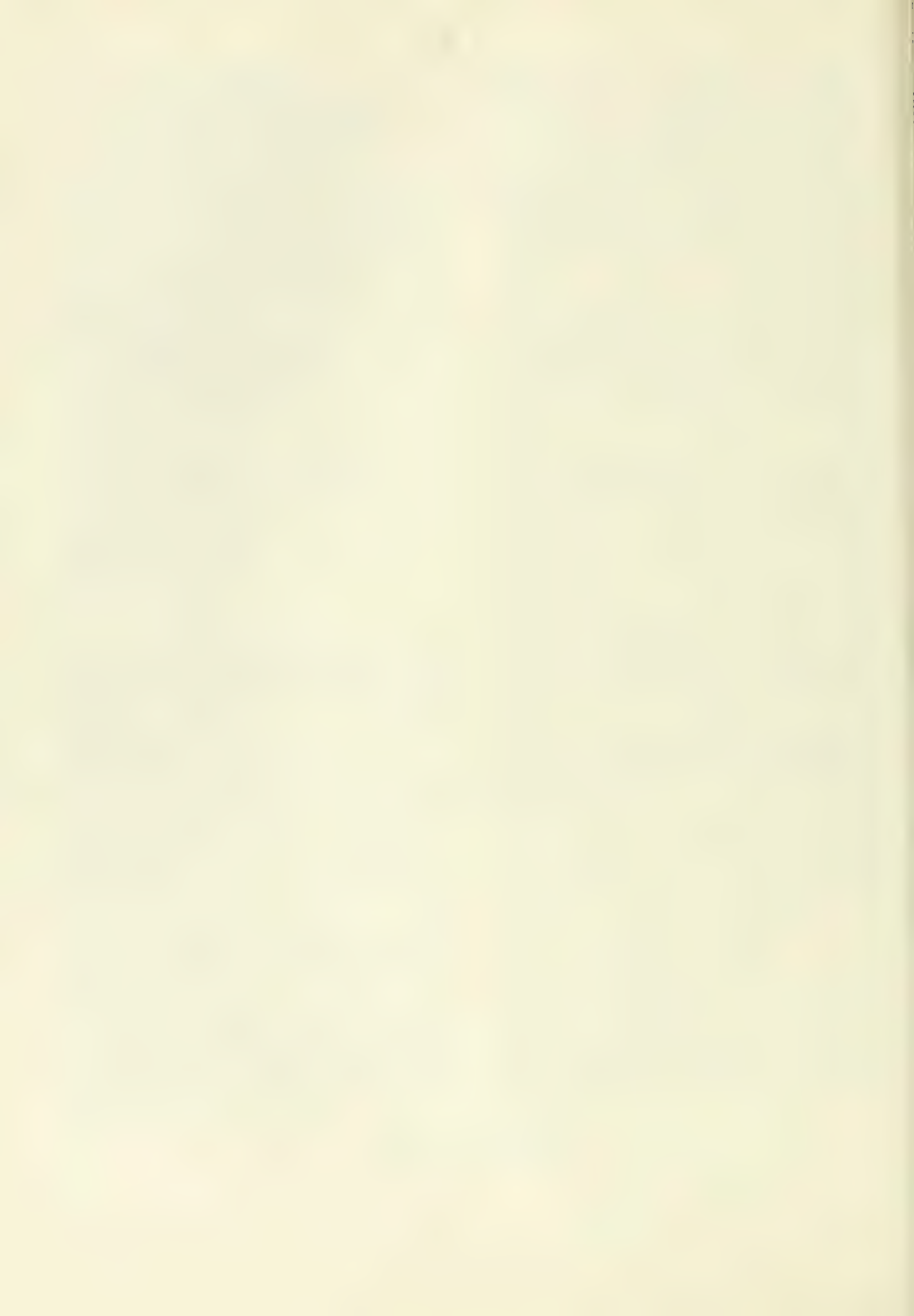
**S6.2.7** The brake temperature is increased to a specified level by conducting one or more stops

**FIGURE 2  
THERMOCOUPLE INSTALLATION**



from 40 mph at a deceleration of 10 fpsps. The brake temperature is decreased to a specified level by rotating the drum or disc at a constant 30 mph.

**36 F.R. 3817  
February 27, 1971**



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 122

### Motorcycle Brake Systems

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 122 (49 CFR § 571.122) that establishes performance requirements for motorcycle brake systems. A notice of proposed rulemaking on this subject was published on March 24, 1971 (36 F.R. 5516).

The safety afforded by a motorcycle's braking system is determined by several factors, including stopping distance, linear stability while stopping, fade resistance, and fade recovery. A safe system should have features that both guard against malfunction and stop the vehicle should a malfunction occur in the normal service system. Standard No. 122 covers each of these aspects of brake safety, establishing equipment and performance requirements appropriate for two-wheeled and three-wheeled motorcycles. These requirements do not differ greatly from the proposals, and comments received in response to the notice have been considered in promulgating the rule.

**I. Equipment.** Each motorcycle is required to have either a split hydraulic service brake system or two independently actuated service brake systems. The latter system encompasses a hydraulic service brake system combined with a hand operated parking brake system. Although several objections were received to the split hydraulic service brake system proposal, the NHTSA has determined that partial failure braking features are necessary in the event of a hydraulic pressure loss in the normal service brake system. If a motorcycle has a hydraulic service brake system, it must also have a reservoir for each master cylinder, and a master cylinder reservoir label advising the proper grade of DOT brake fluid. If the service brake system is a split hydraulic type, a failure indicator lamp is required.

Additionally, three-wheeled motorcycles must be equipped with a friction type parking brake with a solely mechanical means to retain engagement. Some commenters felt that pin or pawl type brakes should be permitted. The Administration does not know of an impact test adequate to test the strength of a mechanical lock, and pin or pawl type brakes, prone to failure upon impact, have been found to be inadequate. The NHTSA concurs, however, with comments objecting to the proposed parking brake indicator lamp, and has determined that the safety benefits involved are negligible in comparison with the expense of providing it.

**II. Performance.** Conformity with performance requirements will be determined by subjecting motorcycles to a series of road tests. Vehicles must demonstrate the effectiveness of their service brake systems by stopping within specified distances from 30 mph, 60 mph, 80 mph, and from a speed divisible by 5 mph that is 4 mph to 8 mph less than the maximum vehicle speed.

Motorcycles will demonstrate fade resistance of their braking systems by making recovery stops subsequent to a series of fade stops from 60 mph. The hand lever force for the final recovery stop must be within plus 20 pounds and minus 10 pounds of the baseline check average force. This is a modification of the proposed "plus 10 pounds or 20 percent, whichever, is less, and minus 20 percent," based upon comments requesting the substitution of absolute values. The same modification is made in the final water recovery stop. The maximum speed fade and recovery proposal has not been adopted, as two and three-wheeled motor vehicles do not have the inherent cooling problems that braking systems on four-wheeled vehicles experience. Retention of the 60 mph stops will ensure that the system maintain adequate stopping ability despite



the high temperatures created by prolonged use, and may reveal undesirable brake lining characteristics such as glazing.

The test sequence has been rearranged so that the parking brake system test for three-wheeled motorcycles occurs immediately before the water recovery test. At this point in the test sequence the brakes will have been fully burnished, and the test will therefore be more indicative of service performance. Parking brake application forces have been modified from the proposal, and specify a maximum applied force of not more than 90 pounds for a foot-operated system and 55 pounds for a hand-operated system. These forces are identical to those specified in S6.10, the test condition on brake actuation forces, and result in a uniformity of brake actuation forces throughout the standard.

Finally, a motorcycle must demonstrate acceptable stopping performance after its brake system has been exposed to water. Comments expressed dissatisfaction with the proposed test procedure, stating that complete immersion of the brakes is not indicative of the manner in which they become wet in actual service. NHTSA agrees that poor braking performance often is not attributable to complete immersion, but rather to prolonged exposure to a constant spray from the road surface. However, there is no basis on which to specify a test procedure reflecting these conditions, and the immersion procedure has, therefore, been retained.

At the end of the test procedure the brake system must pass a durability inspection.

All stops must be made without lockup of any wheel. Two-wheeled motorcycles must remain within an 8-foot-wide lane during stops (modified from the proposed 6-foot-wide lane), and three-wheeled ones within a lane equal to vehicle width plus five feet. Some commenters asked that tests be performed with the clutch engaged. However, the effectiveness of a brake system in bringing a vehicle to a stop within required distances is more accurately judged by requiring that stops be made with the clutch disengaged; there is less reliance on extraneous factors such as use of engine retardation as a braking assist and the varying skills of individual drivers when shifting downward through gears.

Regarding test conditions, comments were received that it is unnecessary for both braking systems of a two-wheeled motorcycle to be within the specified pedal and lever force range simultaneously. The Administration did not concur with these comments. The safety of cyclists requires not only that motorcycles be capable of stopping within specified distances, but also that this capability be demonstrated when reasonable forces are applied to the brake lever and pedal.

Several commenters also objected to the "impossibility" of the test condition that "the wind velocity is zero." The comment reveals misunderstanding of the significance of the test conditions. A manufacturer may test for compliance by running the tests under any wind conditions that are adverse to the vehicle; obviously if the vehicle meets the requirements under adverse wind conditions, it will meet them under no-wind conditions. Similarly, the Government will prove noncompliance by orienting the test runs so that wind conditions are favorable to the vehicle. Thus, the condition uniquely allows testing under whatever wind conditions are present. It is retained as the most practicable and least burdensome test method for all parties.

*Effective date:* September 1, 1973. Because of the necessity to allow manufacturers sufficient production leadtime, it is found for good cause shown, that an effective date later than one year after issuance is in the public interest.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by adding § 571.122, Motor Vehicle Safety Standard No. 122, *Motorcycle Brake System*.

This notice is issued under the authority of section 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on: March 1, 1972.

Charles H. Hartman  
Acting Administrator

37 F.R. 5033  
March 9, 1972

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

### Motorcycle Brake Systems

(Docket No. 1-3; Notice No. 4)

This notice responds to petitions for reconsideration of Motor Vehicle Safety Standard No. 122 (49 CFR § 571.122), and changes the effective date of the standard to January 1, 1974.

Motor Vehicle Safety Standard No. 122 establishing requirements for motorcycle braking equipment, stopping distance, brake system fade and recovery, and wet brake recovery, effective September 1, 1973, was published on March 9, 1972 (37 F.R. 5033). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the rule were filed by Japan Automobile Manufacturers Association, Inc. ("JAMA"), and Cushman Motors ("Cushman") through counsel. In response to these petitions, the effective date of the standard is being changed. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Lining inspection requirement.* S5.1.5 of Standard No. 122 requires a brake system to be installed "so that the lining thickness of drum brake shoes may be visually inspected, either directly or by use of a mirror without removing the drums. . . ." JAMA has petitioned that the word "indirectly" be substituted for "by use of a mirror" in order to allow use of a device such as a wear indicator on the outside of front and rear brake panels. The NHTSA considers wear indicators to be a "direct" method of visual inspection since the extent of lining wear may be determined without removal of the drums. There is no need to amend the Standard to allow their use, and JAMA's petition is denied.

2. *Brake wetting procedure.* The procedure for wetting the brakes prior to testing for wet brake recovery (S7.10.2) specifies the complete immersion of brake assemblies.

JAMA has petitioned that a water trough be substituted, with water depth varying according to the cycle's tire rim size, through which the cycle would be driven for 2 minutes at a speed of 10 m.p.h. JAMA notes that this is similar to the procedure NHTSA proposed in Docket No. 70-27, *Hydraulic Brake Systems*, and commented that the same procedure should apply to all motor vehicles.

The NHTSA has determined that the inherent instability of two- and three-wheeled vehicles under wet road conditions justifies a different test procedure. The difference in configuration between motorcycles and four-wheeled vehicles is distinct enough that there is no assurance motorcycle brakes will be wet, or wet uniformly, by the trough method. It is recognized that neither method may represent the way brakes become wet under actual road conditions, but immersion of brake assemblies has been determined to be the more efficiently reproducible method of establishing a condition under which motorcycle brake system performance may be evaluated. The petition is denied.

3. *Stopping distance.* JAMA and Cushman petitioned for a relaxation of the stopping distance requirements of Table I. JAMA recommended that the stopping distance values in Column II (Preburnish effectiveness, partial mechanical system) and Column III (Effectiveness—total system) up to and including 70 m.p.h. be the stopping distances specified in SAE Recommended Practice J109a. This would mean an increase in range of 39-136 feet for the preburnish stopping distances, and 1-15 feet for total system effectiveness over the values of Standard No. 122. JAMA alleges that stopping distance is highly dependent upon the rider's



ability to control the brakes, and it requested the increased stopping distances to compensate for variations in the rider's skill.

Cushman, whose three-wheeled vehicles have a top speed of 38 m.p.h., requests that all stopping distances from 30 m.p.h. and 35 m.p.h. be modified, alleging that the only way it can meet the stopping distances is by redesigning its vehicle. Cushman also states that it is unaware of any incident where the stopping distances achieved by its present vehicle have become a factor in an accident, and that accordingly there is no need for the stopping distances set forth in Table I, as they apply to Cushman, in order to protect the public.

The NHTSA recognizes that its standards on braking (the forthcoming amendment to Standard No. 105, *Hydraulic Brake Systems*, Standard No. 121, *Air Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*) impose stringent requirements on the manufacturers of all types of vehicles, and that, in some instances, redesign may be necessary. But because of the ever increasing numbers of vehicles on urban and interstate roadways, and of passenger-miles traveled, the NHTSA considers improved braking systems to be the highest priority in its program of accident avoidance. Prompt and accurate braking response is deemed especially critical in providing a margin by which the vulnerable motorcyclist may escape death or serious injury. While the fatality rate for all motor vehicle occupants fell 3.8 per cent in 1970, it rose 18.9 per cent for motorcycle riders. Motorcycles account for less than 2.3 per cent of total vehicle registrations, but they are involved in 3.6 per cent of all fatal accidents. Therefore, the necessity that the industry achieve the full capability of the present

state of the art has been found to outweigh the problems caused the individual manufacturers by compliance.

The NHTSA recognizes the effect of rider control upon stopping distance in the wording of S7, which deems stopping distance requirements met if only one of the specified number of stops occurs within the maximum allowable stopping distances. Comments to Docket No. 1-3 indicate that it is clearly reasonable and practicable to require motorcycles to meet the stopping distances adopted for Standard No. 122. The petitions of JAMA and Cushman are denied.

4. *Effective date.* JAMA has requested a 4 month delay in the effective date of Standard No. 122 because model changeover time for Japanese manufacturers extends through autumn to the end of the year. It estimates that only 50 per cent of the industry could be brought into compliance by September 1, 1973. In light of the design changes that may be necessitated, the Administrator finds this request reasonable and that for good cause shown a later effective date is in the public interest. The effective date of Standard No. 122 is hereby changed to January 1, 1974.

The notice is issued pursuant to the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on June 9, 1972.

Douglas W. Toms  
Administrator

37 F.R. 11973  
June 16, 1972



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

## Motorcycle Brake Systems

(Docket No. 1-3; Notice 6)

This notice amends Motor Vehicle Safety Standard No. 122, *Motorcycle Brake Systems*, 49 CFR 571.122, to modify the master cylinder labeling and the wetting procedure for the water recovery test, effective January 1, 1974.

The amendment is based upon a notice published December 15, 1972, (37 F.R. 26739). The NHTSA proposed a change in the wording of the master cylinder reservoir label which would be identical to that specified in Motor Vehicle Safety Standard No. 105a, *Hydraulic Brake Systems* (37 F.R. 17970). In addition, a change in the wetting procedure for the water recovery test was proposed to require sequential immersion of the front and rear brake assemblies in lieu of simultaneous immersion.

The comments received generally supported the proposal. Some minor changes were requested, and Standard No. 122 is being amended accordingly. The reservoir labeling requirements have been modified in format in a manner consistent with recent amendments to Standard No. 105a (38 F.R. 13017). The height of the lettering has been retained at 3/32 of an inch. In order to avoid any misinterpretation, it is the NHTSA's intent to have the label completed with DOT and the grade of fluid designed for use in the system and not a manufacturer's brand name and number. If, however, silicone-based or petroleum-based fluids are appropriate for the system design specific fluids may be designated until a DOT grade and performance requirements have been specified. A contrast in color will be required only of printed labels. For this purpose, it has been decided that raised or lowered

letters will provide a sufficient degree of legibility.

Finally, based on a comment made by the Japan Automobile Manufacturers Association, Inc. (JAMA), the wetting procedure for the water recovery test has been changed to extend the maximum testing time from 5 minutes to 7 minutes. JAMA stated that immersion of the rear brake first would still create engine stall problems if the water were allowed to enter the engine through the muffler(s) during the front brake assembly immersion period. The NHTSA feels strongly that the front brake should be immersed last due to potential instabilities created by a "grabbing" front brake. The extra time which has been allotted should be sufficient for manufacturers to provide protection for the exhaust system, thereby alleviating the problem of engine stall, and providing a measure of relief for those who considered the 5-minute period as excessively short.

In consideration of the foregoing, 49 CFR § 571.122, Motor Vehicle Safety Standard No. 122, is amended. . . .

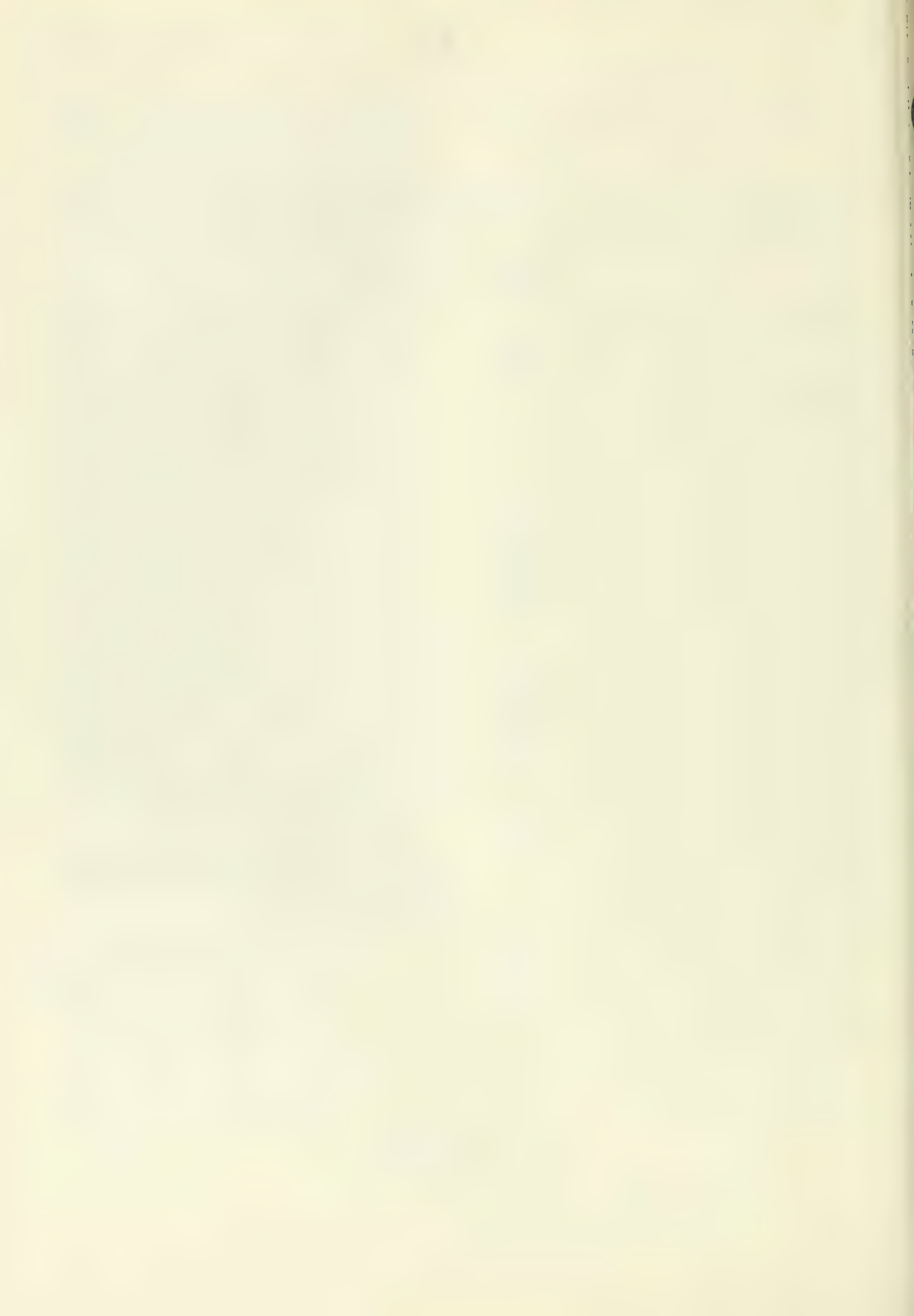
*Effective date:* January 1, 1974.

(Secs. 103, 112, 119 Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 38 F.R. 12147)

Issued on May 30, 1973.

James E. Wilson  
Associate Administrator  
Traffic Safety Programs

**38 F.R. 14753**  
**June 5, 1973**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122****(Docket No. 74-16; Notice 2)**

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distance values for the various tests should be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars*. As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by

some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.



The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor-driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unneces-

sary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown that an effective date earlier than 180 days after issuance of the amendments is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on September 6, 1974.

James B. Gregory  
Administrator

**39 F.R. 32914**  
**September 12, 1974**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

### Motorcycle Brake Systems

This notice corrects an error in paragraph S7.8.1 of 49 CFR 571.122, Motor Vehicle Safety Standard No. 122, *Motorcycle Brake Systems*.

On March 24, 1971 NHTSA proposed (36 FR 5516) as part of its anticipated motorcycle braking standard, that the final effectiveness test "repeat S7.6 including S7.3.1". Proposed S7.6 was the service brake system second effectiveness test. When Standard No. 122 was issued on March 9, 1972 (37 F.R. 5033) the proposal was adopted, in S7.8.1, that the final effectiveness test "Repeat S7.6 including S7.3.1". However, in the development of the final rule the test sequence was rearranged and the second effectiveness test had become S7.5. Through oversight, a corresponding change was not made in the final effectiveness test provisions. Accordingly the change is being made by this notice.

In consideration of the foregoing, paragraph S7.8.1 of 49 CFR § 571.122, Motor Vehicle Safety Standard No. 122 is revised to read "S7.8.1 *Service brake system*. Repeat S7.5 including S7.3.1".

*Effective date:* December 10, 1974. Because the notice corrects an error and creates no additional burden upon any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51)

Issued on December 4, 1974.

James B. Gregory  
Administrator

**39 F.R. 43075**  
**December 10, 1974**





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

## Motorcycle Brake Systems

(Docket No. 75-27; Notice 4)

This notice amends Standard No. 105-75, *Hydraulic Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*, to modify the means for establishing the frictional resistance of the surface on which stopping distance tests are conducted. A similar amendment is made to Part 575, *Consumer Information*, of Title 49 of the Code of Federal Regulations.

The National Highway Traffic Safety Administration (NHTSA) proposed the change in Standard No. 105-75 (49 CFR 571.105-75), Standard No. 121, *Air Brake Systems* (49 CFR 571.121), Standard No. 122 (49 CFR 571.122), and the Consumer Information Regulations (49 CFR 575.101) in response to a petition from British-Leyland Motors Limited (40 FR 45200, October 1, 1975). The existing test procedure in these regulations has specified use of the American Society for Testing and Materials (ASTM) E-274-65T procedure, using an ASTM E249 tire that is no longer manufactured.

Responses were received on the proposed ASTM change from White Motor Corporation (White), Mack Trucks, Inc. (Mack), Freightliner Corporation (Freightliner), Ford Motor Company (Ford), General Motors Corporation (GM), Chrysler Corporation (Chrysler), American Motors Corporation (AMC), and International Harvester (IH). The National Motor Vehicle Safety Advisory Council made no comment on the proposal.

Most commenters supported use of the new test procedure and tire, although they differed in recommendations for correlating the reading produced under the new procedure with that produced under the old procedure. Manufacturers are presently certifying compliance to brake standards on test surfaces with a satisfactory reading under the old procedure, and they should

be able to continue testing and certifying compliance on the same surface without any increase in the severity of the tests. To accomplish this transition, the correlation in readings between the procedures has been determined, and the difference is reflected in a change of the dry surface value from "skid number" 75 to "skid number" 81.

Freightliner urged postponement of any action until it could be supported by "adequate and statistically reliable test data." AMC also recommended that the NHTSA do nothing "until the industry has had sufficient time to evaluate and verify the performance of the ASTM E501 test tire on all types of surfaces."

The change in procedure is prompted by the ASTM decision to utilize a new tire in ascertaining the frictional coefficient of test surfaces. As a result the old tire is no longer manufactured and only the new tire is available for skid number measurement. Manufacturers have conducted comparative tests with the new tire to determine the correlation between the readings given by the two tires. Neither Freightliner nor AMC submitted data showing that the agency's proposal to adjust the dry surface skid number upwards is unjustified. Only Mack submitted data and it supported the NHTSA and Federal Highway Administration test data that have been placed in the docket. General Motors considered the agency's proposed upward adjustment to be the maximum desirable based on its data. International Harvester, Chrysler, and Ford supported the change in dry surface skid number without qualification, and White suggested that a skid number of 85 be utilized. The agency finds that the AMC and Freightliner requests for further delay are unjustified.

Ford and Freightliner asked that the skid number for the lower coefficient (wet) surface also be adjusted. The agency's purpose in proposing the adjustment is limited to changes necessary to avoid a modification of the test surfaces or an increase in the severity of performance levels specified under the safety standards. The NHTSA earlier concluded that change of the wet surface specification was unnecessary, and no evidence has been supplied that would modify the earlier determination.

General Motors noted that an editorial change to the newer ASTM procedure does not appear in early publications of that procedure. To put all interested persons on notice of the editorial change, the NHTSA has included the change in its references to the ASTM E274-70 procedure.

Freightliner asserted that the newer procedure included modification of a formula that justified a larger upwards adjustment than that proposed by the agency. Actually, the modifications only corrected an error in the earlier formula which had no effect on the determination of frictional coefficient. Manufacturers either utilized a test trailer that obviated the need for calculations using the formula, or were aware of the error and corrected for it in their calculations. Thus the adjustment requested by Freightliner is not warranted.

In accordance with recently-enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16201, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this amendment on the public and private sectors, including possible loss of safety benefit. Because the new references to procedures and a test tire are expected to accord with existing practices, the amendment is judged not to have any significant impact on costs or benefits of the standards and

consumer information item that are modified by the change.

Standard No. 121, *Air Brake Systems*, is presently subject to judicial review under § 105(a) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1394(a)). The U.S. Court of Appeals hearing the petition for review has indicated that it prefers to review the standard as it presently exists, without unnecessary amendment. To the degree possible, the agency is complying with that request and therefore, in the case of Standard No. 121, will delay the update of ASTM procedure until review is completed.

It is noted that this change in procedure for ascertaining the frictional resistance of the test surface does not invalidate data collected using the older procedure, and manufacturers can presumably certify on the basis of stopping distance tests conducted on surfaces measured by the old tire.

In consideration of the foregoing, amendments are made in Chapter V of Title 49, Code of Federal Regulations.

*Effective date:* June 14, 1976. Because the older test tire is no longer manufactured, and because the amendment of procedure and test tire is intended only to duplicate the existing procedure and tire, this amendment creates no additional requirements for any person, and an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 8, 1976.

James B. Gregory  
Administrator

**41 F.R. 24592**  
**June 17, 1976**



**PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 122**

(Docket No. 78-14; Notice 1)

**Motorcycle Brake Systems**

This notice amends Motor Vehicle Safety Standard No. 122 *Motorcycle Brake Systems*, to incorporate an interpretation, clarifying that the parking brake system test for a 3-wheeled motorcycle does not require that a vehicle be held on a 30 percent grade for 5 minutes if the limit of traction of its braked wheels is reached on a lower grade so that the vehicle begins to slide. This notice also amends the standard to clarify the conditions under which traction is determined. The action is occasioned by a recent interpretation of the agency provided in response to a petition for temporary exemption from Standard No. 122 by Daihatsu Motor Company whose B-20 vehicle's limit of traction was reached on a 20 percent grade (43 F.R. 36548). The amendment has no effect upon safety since it is a statement and clarification of an existing agency interpretation.

Effective date: As an interpretative rule, the amendment is effective upon publication in the Federal Register. October 10, 1978.

For further information contact:

Scott Shadle, Office of Rulemaking, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2153).

Supplementary information: Paragraph S5.6 of 49 CFR 571.122, Motor Vehicle Safety Standard No. 122, requires in part that the parking brake system for a 3-wheeled motorcycle "be capable of holding the motorcycle, for 5 minutes in both forward and reverse directions, on a 30 percent grade. . . ." Recently the agency entertained a petition from Daihatsu Motor Company, Ltd. for a renewal of an exemption granted an electric motor-driven cycle in 1976 because of the inability of its braked wheels to hold it on a 30 percent grade in the reverse direction. The agency disposed of the petition by publishing an interpretation allowing Daihatsu to certify compliance with Standard No. 122, stating that

the agency did not intend "to dictate design requirements such as center of gravity location and tire design mandating that the vehicle itself have a limit of traction sufficient to hold it on a grade that is 30 percent or greater when its wheels are braked." (43 F.R. 36548)

NHTSA has decided to incorporate this interpretation into Standard No. 122 by appropriate amendments to the parking brake system requirement (S5.6) and test procedures (S7.9). A similar limit-of-traction provision already exists with respect to the parking brake system requirements for hydraulically braked vehicles (paragraph S5.2.1 of 49 CFR 571.105).

This notice also amends Standard No. 122 to set forth the road surface on which traction is to be determined. As in the case of the parking brake test conditions in paragraph S6.9 of 49 CFR 571.105 and paragraph S5.6.2 of 59 CFR 571.121, Air Brake Systems, this notice specifies a surface of clean, dry, smooth portland cement concrete.

Because the amendment is an interpretative rule, under the Administrative Procedures Act it may be adopted without prior notice and public comment (5 U.S.C. 553(b)).

The principal authors of this amendment are Taylor Vinson of the Office of Chief Counsel and John Carson of the Office of Rulemaking.

In consideration of the foregoing, 49 CFR 571.122, Motor Vehicle Safety Standard No. 122 is amended. . . .

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on October 3, 1978.

Joan Claybrook  
Administrator

**43 F.R. 46547-46548**  
**October 10, 1978**





# MOTOR VEHICLE SAFETY STANDARD NO. 122

## Motorcycle Brake Systems

**S1. Scope.** This standard specifies performance requirements for motorcycle brake systems.

**S2. Purpose.** The purpose of the standard is to insure safe motorcycle braking performance under normal and emergency conditions.

**S3. Application.** This standard applies to motorcycles.

### S4. Definitions.

“Braking interval” means the distance measured from the start of one brake application to the start of the next brake application.

“Initial brake temperature” means the temperature of the hottest service brake of the vehicle 0.2 miles before any brake application.

“Skid number” means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials (ASTM) Method E-274-70 (as revised July 1974) at 40 mph, omitting water delivery as specified in paragraphs 7.1 and 7.2 of that method.

“Stopping distance” means the distance traveled by a vehicle from the start of the brake application to the point where the vehicle stops.

“Split service brake system” means a brake system consisting of two or more subsystems actuated by a single control designed so that a leakage-type failure of a pressure component in a single subsystem (except structural failure of a housing that is common to all subsystems) shall not impair the operation of the other subsystem(s).

**S.5 Requirements.** Each motorcycle shall meet the following requirements under the conditions specified in S6, when tested according to the procedures and in the sequence specified in S7. Corresponding test procedures of S7 are indicated in parentheses. If a motorcycle is in-

TABLE I  
STOPPING DISTANCES FOR EFFECTIVENESS, FADE AND  
PARTIAL SYSTEM TESTS

Stopping distance, feet				
Effectiveness tests				
Vehicle test speed m.p.h.	Preburnish effectiveness total system (S5.2.1)	Preburnish effectiveness partial mechanical systems (S5.2.2)	Effectiveness total system (S5.4) (S5.7.1)	Effectiveness partial hydraulic systems (S5.7.2)
	I	II	III	IV
15	13	30	11	25
20	24	54	19	44
25	37	84	30	68
30	54	121	43	97
35	74	165	58	132
40	96	216	75	173
45	121	273	95	218
50	150	337	128	264
55	181	407	155	326
60	216	484	185	388
65			217	415
70			264	527
75			303	606
80			345	689
85			389	788
90			484	872
95			540	971
100			598	1076
105			659	1188
110			723	1302
115			791	1423
120			861	1549

TABLE II  
BRAKE TEST SEQUENCE AND REQUIREMENTS

SEQUENCE	L.C.	Test procedure	Requirements
1	Instrumentation check	S7.2	
2	First (Preburnish) effectiveness test:		
	(a) Service brake system	S7.3.1	S5.2.1
	(b) Partial service brake system	S7.3.2	S5.2.2
3	Burnish procedure	S7.4	
4	Second effectiveness test	S7.5	S5.3
5	First fade and recovery test	S7.6	S5.4
6	Reburnish	S7.7	
7	Final effectiveness test:		
	(a) Service brake system	S7.8.1	S5.5.1
	(b) Partial service brake system	S7.8.2	S5.5.2
8	Parking brake test		
	(three wheeled motorcycles only)	S7.9	S5.6
9	Water recovery test	S7.10	S5.8
10	Design durability	S7.11	S5.8

capable of attaining a specified speed, its service brakes shall be capable of stopping the vehicle from the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile, within stopping distances that do not exceed the stopping distances specified in Table 1.

**S5.1 Required equipment—split service brake system.** Each motorcycle shall have either a split service brake system or two independently actuated service brake systems.

**S5.1.1 Mechanical service brake system.** Failure of any component in a mechanical service brake system shall not result in a loss of braking ability in the other service brake system on the vehicle.

**S5.1.2 Hydraulic service brake system.** A leakage failure in a hydraulic service brake system shall not result in a loss of braking ability in the other service brake system on the vehicle. Each motorcycle equipped with a hydraulic brake system shall have the equipment specified in S5.1.2.1 and S5.1.2.2.

**S5.1.2.1 Master cylinder reservoirs.** Each master cylinder shall have a separate reservoir for each brake circuit, with each reservoir filler opening having its own cover, seal, and cover retention device. Each reservoir shall have a minimum capacity equivalent to one and one-half times the total fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir move from a new lining, fully retracted position to a fully worn, fully applied position. Where adjustment is a factor, the worst condition of adjustment shall be used for this measurement.

**S5.1.2.2 [Reservoir labeling.]** Each motorcycle shall have a brake fluid warning statement that reads as follows, in letters at least 3/32 of an inch high:

**“WARNING:** Clean filler cap before removing. Use only \_\_\_\_\_ fluid from a sealed container.”  
(Inserting the recommended type of brake fluid as specified in 49 CFR § 571.116, e.g. DOT 3)

The lettering shall be—

(a) Permanently affixed, engraved or embossed;

(b) Located so as to be visible by direct view, either on or within 4 inches of the brake fluid reservoir filler plus or cap; and

(c) Of a color that contrasts with its background, if it is not engraved or embossed.

**S5.1.3. Split service brake system.** In addition to the equipment required by S5.1.2 each motorcycle equipped with a split service brake system shall have a failure indicator lamp as specified in S5.1.3.1.

**S5.1.3.1 Failure indicator lamp.**

(a) One or more electrically operated service brake system failure indicator lamps that is mounted in front of and in clear view of the driver, and that is activated—

(1) In the event of pressure failure in any part of the service brake system, other than a structural failure of either a brake master cylinder body in a split integral body type master cylinder system or a service brake system failure indicator body, before or upon application of not more than 20 pounds of pedal force upon the service brake.

(2) Without the application of pedal force, when the level of brake fluid in a master cylinder reservoir drops to less than the recommended safe level specified by the manufacturer or to less than one-half the fluid reservoir capacity, whichever is the greater.

(b) All failure indicator lamps shall be activated when the ignition switch is turned from the “off” to the “on” or to the “start” position.

(c) Except for the momentary activation required by S5.1.3.1(b), each indicator lamp, once activated, shall remain activated as long as the condition exists, whenever the ignition switch is in the “on” position. An indicator lamp activated when the ignition is turned to the “start” position shall be deactivated upon return of the switch to the “on” position unless a failure exists in the service brake system.

(d) Each indicator lamp shall have a red lens with the legend “Brake Failure” on or adjacent to it in letters not less than 3/32 of an inch high that shall be legible to the driver in daylight when lighted.

**S5.1.4 Parking Brake.** Each three-wheeled motorcycle shall be equipped with a parking brake of a friction type with a solely mechanical means to retain engagement.



**S5.1.5 Other requirements.** The brake system shall be installed so that the lining thickness of drum brake shoes may be visually inspected, either directly or by use of a mirror without removing the drums, and so that disc brake friction lining thickness may be visually inspected without removing the pads.

**S5.2 Service Brake System.** First (pre-burnish) effectiveness.

**S5.2.1 Service brake system.** The service brakes shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances which do not exceed the stopping distances specified in Column I of Table I (S7.3.1).

**S5.2.2 Partial service brake system.** Each independently actuated service brake system on each motorcycle shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances which do not exceed the stopping distances specified in Column II of Table I (S7.3.2).

**S5.3 Service brake system—second effectiveness.** The service brakes shall be capable of stopping the motorcycle from 30 mph, 60 mph, 80 mph, and the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile if this speed is 95 mph or greater, within stopping distances that do not exceed the stopping distances specified in Column III of Table I (S7.5).

**S5.4 Service brake system—fade and recovery.**

These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

**S5.4.1 Baseline check—minimum and maximum pedal forces.** The pedal and lever forces used in establishing the fade baseline check average shall be within the limits specified in S6.10 (S7.6.1).

**S5.4.2 Fade.** Each motorcycle shall be capable of making 10 fade stops from 60 mph at not less than 15 fpsps for each stop (S7.6.2).

**S5.4.3 Fade recovery.** Each motorcycle shall be capable of making five recovery stops with a pedal force that does not exceed 90 pounds, and a hand lever force that does not exceed 55 pounds

for any of the first four recovery stops and that for the fifth recovery stop is within plus 20 pounds and minus 10 pounds of the fade test baseline check average force (S7.6.3).

**S5.5 Service brake system—final effectiveness.**

These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

**S5.5.1 Service brake system.** The service brakes shall be capable of stopping the motorcycle in a manner that complies with S5.3 (S7.8.1).

**S5.5.2 Hydraulic service brake system—partial failure.** In the event of a pressure component leakage failure, other than a structural failure of either a brake master cylinder body in a split integral body type master cylinder system or a service brake system failure indicator body, the remaining portion of the service brake system shall continue to operate and shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances that do not exceed the stopping distances specified in Column IV of Table I (S7.8.2).

**S5.6 Parking brake system.** The parking brake system shall be capable of holding the motorcycle stationary (to the limits of traction of the braked wheels), for 5 minutes, in both forward and reverse directions, on a 30 percent grade, with an applied force of not more than 90 pounds for a foot-operated system and 55 pounds for a hand-operated system (S7.9).

**S5.7 Service brake system—water recovery.**

**S5.7.1 Baseline check.** The pedal and lever forces used in establishing the water recovery baseline check average shall be within the limits specified in S6.10 (S7.10.1).

**S5.7.2 Water recovery test.** Each motorcycle shall be capable of making five recovery stops with a pedal force that does not exceed 90 pounds, and a hand lever force that does not exceed 55 pounds, for any of the first four recovery stops, and that for the fifth recovery stop is within plus 20 pounds and minus 10 pounds of the baseline check average force (S7.10.2).

**S5.8 Service brake system design durability.** Each motorcycle shall be capable of completing all braking requirements of S5 without detachment of brake linings from the shoes or pad, detachment or fracture of any brake system components, or leakage of fluid or lubricant at the wheel cylinder and master cylinder reservoir cover, seal, or retention device (S7.11).

**S6. Test conditions.** The requirements of S5 shall be met under the following conditions. Where a range of conditions is specified, the motorcycle shall be capable of meeting the requirements at all points within the range.

**S6.1 Vehicle weight.** Motorcycle weight is unloaded vehicle weight plus 200 pounds (including driver and instrumentation), with the added weight distributed in the saddle or carrier if so equipped.

**S6.2 Tire inflation pressure.** Tire inflation pressure is the pressure recommended by the manufacturer for the vehicle weight specified in paragraph S6.1.

**S6.3 Transmission.** Unless otherwise specified, all stops are made with the clutch disengaged.

**S6.4 Engine.** Engine idle speed and ignition timing settings are according to the manufacturer's recommendations. If the vehicle is equipped with an adjustable engine speed governor, it is adjusted according to the manufacturer's recommendation.

**S6.5 Ambient temperature.** The ambient temperature is between 32° and 100° F.

**S6.6 Wind velocity.** The wind velocity is zero.

**S6.7 Road surface.** Road tests are conducted on level roadway having a skid number of 81. The roadway is 8 feet wide for two-wheeled motorcycles, and overall vehicle width plus 5 feet for three-wheeled motorcycles. The parking brake test surface is clean, dry, smooth portland cement concrete.

**S6.8 Vehicle position.** The motorcycle is aligned in the center of the roadway at the start

of each brake application. Stops are made without any part of the motorcycle leaving the roadway and without lockup of any wheel.

**S6.7 Thermocouples.** The brake temperature is measured by plug-type thermocouples installed in the approximate center of the facing length and width of the most heavily loaded shoe or disc pad, one per brake, as shown in Figure 1.

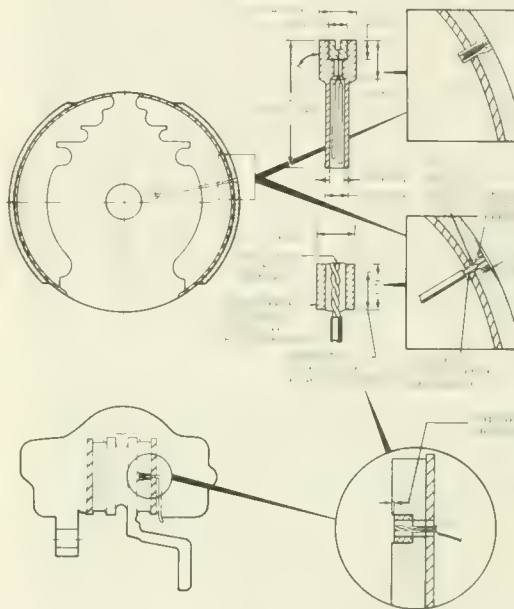


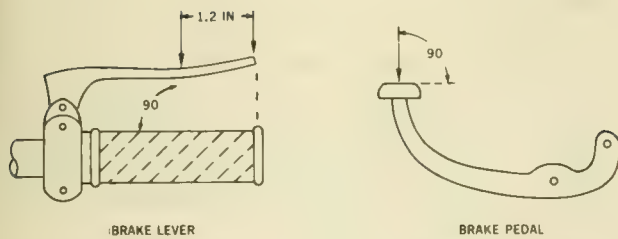
FIGURE 1

TYPICAL PLUG TYPE  
THERMOCOUPLE INSTALLATIONS

**S6.10 Brake actuation forces.** Except for the requirements of the fifth recovery stop in S5.4.3 and S5.7.2 (S7.6.3 and S7.10.2) the hand lever force is not less than five and not more than 55 pounds and the foot pedal force is not less than 10 and not more than 90 pounds. The point of initial application of the lever forces is 1.2 inches from the end of the brake lever grip. The direction of the force is perpendicular to the handle grip on the plane along which the brake lever rotates, and the point of application of the pedal force is the center of the foot contact pad of the brake pedal. The direction of the force is perpendicular to the foot contact pad on the plane along which the brake pedal rotates, as shown in Figure 2.



FIG. 2 DIRECTION OF FORCE



**S7. Test procedures and sequence.** Each motorcycle shall be capable of meeting all the requirements of this standard when tested according to the procedures and in the sequence set forth below without replacing any brake system part, or making any adjustments to the brake system other than as permitted in S7.4. A motorcycle shall be deemed to comply with S5.2, S5.3 and S5.5 if at least one of the stops specified in S7.3, S7.5 and S7.8 is made within the stopping distances specified in Table I.

**S7.1 Braking warming.** If the initial brake temperature for the first stop in a test procedure (other than S7.10) has not been reached, heat the brakes to the initial brake temperature by making up to 10 stops from 30 mph at a deceleration of not more than 10 fpsps. On independently operated brake systems, the coldest brake shall be within 10° F of the hottest brake.

**S7.2 Pretest instrumentation check.** Conduct a general check of test instrumentation by making not more than 10 stops from a speed of not more than 30 mph at a deceleration of not more than 10 fpsps. If test instrument repair, replacement, or adjustment is necessary, make not more than 10 additional stops after such repair, replacement or adjustment.

### **S7.3 Service brake system - first (preburnished) effectiveness test.**

**S7.3.1 Service brake system.** Make six stops from 30 mph and then six stops from 60 mph with an initial brake temperature between 130° F and 150° F.

**S7.3.2 Partial service brake system.** For a motorcycle with two independently actuated service brake systems, repeat S7.3.1 using each service brake system individually.

**S7.4 Service brake system—burnish procedure.** Burnish the brakes by making 200 stops from 30 mph at 12 fpsps. The braking interval shall be either the distance necessary to reduce the initial brake temperature to between 130° F and 150° F or 1 mile, whichever occurs first. Accelerate at maximum rate to 30 mph immediately after each stop and maintain that speed until making the next stop. After burnishing adjust the brakes in accordance with the manufacturer's recommendation.

**S7.5 Service brake system—second effectiveness test.** Repeat S7.3.1. Then, make four stops from 80 mph and four stops from the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile if that speed is 95 mph or greater.

**S7.6 Service brake system—fade and recovery test.** These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

**S7.6.1 Baseline check stops.** Make three stops from 30 mph at 10 to 11 fpsps for each stop. Compute the average of the maximum brake pedal forces and the maximum brake lever forces required for the three stops.

**S7.6.2 Fade stops.** Make 10 stops from 60 mph at not less than 15 fpsps for each stop. The initial brake temperature before the first brake application shall be between 130° F and 150° F. Initial brake temperatures before brake applications for subsequent stops shall be those occurring at the distance intervals. Attain the required deceleration as quickly as possible and maintain at least this rate for not less than three-fourths of the total stopping distance for each stop. The interval between the starts of service brake applications shall be 0.4 mile. Drive 1 mile at 30 mph after the last fade stop and immediately conduct the recovery test specified in S7.6.3.

**S7.6.3 Recovery test.** Make five stops from 30 mph at 10 to 11 fpsps for each stop. The braking interval shall not be more than 1 mile. Immediately after each stop accelerate at maximum rate to 30 mph and maintain that speed until making the next stop.



**S7.7 Service brake system—reburnish.** Repeat S7.4 except make 35 burnish stops instead of 200 stops. Brakes may be adjusted after reburnish if no tools are used. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

**S7.8 Service brake system—final effectiveness test.** These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

**S7.8.1 Service brake system.** Repeat S7.5 including S7.3.1.

**S7.8.2 Partial service brake system test.** Alter the service brake system on three-wheeled motorcycles to induce a complete loss of braking in any one subsystem. Determine the line pressure or pedal force necessary to cause the brake system failure indicator to operate. Make six stops from 30 mph and then six stops from 60 mph with an initial brake temperature between 130° F and 150° F. Repeat for each subsystem. Determine that the brake failure indicator is operating when the master cylinder fluid level is less than the level specified in S5.1.3.1(a) (2), and that it complies with S5.1.3.1(c). Check for proper operation with each reservoir in turn at a low level. Restore the service brake system to normal at completion of this test.

**S7.9 Parking brake test.** Starting with an initial brake temperature of not more than 150° F drive the motorcycle downhill on the 30 percent grade with the longitudinal axis of the motorcycle in the direction of the grade. Apply the service brakes with a force not exceeding 90 pounds to stop the motorcycle and place the transmission in neutral. Apply the parking brake by exerting a force not exceeding those specified in S5.6 Release the service brake and allow the motorcycle to remain at rest (to the limit of traction of the braked wheels) for 5 minutes. Repeat the test with the motorcycle parked in the reverse (uphill) position on the grade.

**S7.10 Service brake system—water recovery test.**

**S7.10.1 Baseline check stops.** Make three stops from 30 mph at 10 to 11 fpsps for each stop. Compute the average of the maximum brake pedal forces and of the maximum brake lever forces required for the three stops.

**S7.10.2 Wet brake recovery stops.** Completely immerse the rear brake assembly of the motorcycle in water for 2 minutes with the brake fully released. Next completely immerse the front brake assembly of the motorcycle in water for 2 minutes with the brake fully released. Perform the entire wetting procedure in not more than 7 minutes. Immediately after removal of the front brake from water, accelerate at a maximum rate of 30 mph without a brake application. Immediately upon reaching that speed make five stops, each from 30 mph at 10 to 11 fpsps for each stop. After each stop (except the last) accelerate the motorcycle immediately at a maximum rate to 30 mph and begin the next stop.

**S7.11 Final inspection.** Upon completion of all the tests inspect the brake system in an assembled condition, for compliance with the brake lining inspection requirements. Disassemble all brakes and inspect:

(a) The entire brake system for detachment or fracture of any component;

(b) Brake linings for detachment from the shoe or pad;

(c) Wheel cylinder, master cylinder, and axle seals for fluid or lubricant leakage;

(d) Master cylinder for reservoir capacity and retention device; and

(e) Master cylinder label for compliance with S5.1.2.2.

37 F.R. 5033  
March 9, 1972

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 123

### Motorcycle Controls and Displays

(Docket No. 70-26; Notice 3)

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 123 (49 CFR § 571.123) that establishes requirements for motorcycle controls and displays. A notice of proposed rulemaking on this subject was published on November 6, 1970 (35 F.R. 17117).

The National Highway Traffic Safety Administration estimates that over 3,000 accidents may be avoided annually by specifying a uniform standard for motorcycle controls and displays. As this agency commented in the prior notice: "Controls and displays link the operator and the machine, and if there is confusion as to their location, interpretation, or operation, a dangerous situation may result. A cyclist, especially the novice and the cyclist who has changed from one make of machine to another, must not hesitate when confronted with an emergency." The purpose of the new standard is to minimize operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

The basic operational requirement of Standard No. 123 is that handlebar-mounted controls be operable throughout their full range without the operator removing his hand from the handgrip. Standard No. 123 requires all motorcycles to have a supplemental engine stop control, operable from the right handlebar, intended for use in emergency situations. Notice of this requirement was proposed in Notice 2 to Docket No. 69-20, *Accelerator Control Systems* (35 F.R. 15241). Standard No. 123 also requires that if any of ten other specified equipment items are provided on a motorcycle, the location and method of operation of the applicable control shall be standardized. These items are: manual clutch or integrated clutch and gear change,

foot-operated gear change, headlamp upper-lower beam control, horn, turn signal lamps, ignition, manual fuel shutoff control, twist-grip throttle, front wheel brake, and rear wheel brakes. Motorcycles that are designed and sold exclusively for use by law enforcement agencies are excluded from Standard No. 123, as the configuration of certain controls on such vehicles, necessary for law enforcement purposes, differs from that required by the new standard. Proposals applicable to the instrument illumination intensity control, the electric starter, and the kick starter have not been adopted as insufficient correlation with motor vehicle safety has been found for these items.

As noted below, some of the location and operational requirements that were proposed have not been adopted in the following instances. Otherwise, the location and operation of controls are required as proposed.

1. *Foot-operated gear change.* The likelihood of inadvertent engagement of reverse gear has been found to be so slight that a means to prohibit it has not been found necessary. Further, no requirement has been specified for location of neutral gear. Under Proposal A, neutral would have occurred lowest in the gear sequence. Proposal A was not adopted because of the likelihood of overshooting low gear when downshifting, thus contributing to a possible loss of control. In Proposal B, the transmission would be put into neutral by a rearward motion of the operator's heel on a control device separate from the shift lever. This method was not adopted since it appears to have no inherent safety advantages over any other means of finding neutral. The intent of Proposal B was to ensure that neutral can reliably be selected when desired without being selected inadvertently when not



desired. The conventional neutral light may serve as an aid to such shifting; however, any system which requires eye movements away from the road merely to shift gears cannot be considered to be an adjunct to safety.

The present standard does not impose specific requirements for ease of locating the gear position, or for protection against inadvertent shifting into neutral. However, the Administration considers these to be desirable objectives and will consider amending the standard if it appears necessary to do so.

2. *Headlamp control.* Because heavy gloves are needed for safe riding, only a simple "up for higher beam, down for lower beam" requirement has been adopted.

3. *Turn signal lamps.* Because turn signal lamps are not a required item of motorcycle equipment until January 1, 1973, and the industry is experimenting with various controls, Standard No. 123 specifies only that the turn signal lamp control be located on the handlebars.

4. *Ignition:* Because of the adoption of the requirement that motorcycles be equipped with a supplemental engine stop control on the right handlebar, the need to specify a location and method of operation for the ignition has diminished. Accordingly, the sole ignition control requirement is that the "off" position be counter-clockwise from all other positions.

5. *Manual fuel shutoff control.* The requirements adopted do not apply to automatic fuel shutoff controls. No location for a manual control is specified. Based upon comments, revisions have been made in the direction of valve operation.

Substantial modifications have been made as well in the display proposals. Because of the limited range within which displays can be lo-

cated on a motorcycle, it has been determined that no specific location requirements are necessary. Illumination of the neutral position and the speedometer has been deemed essential; the proposal that a green lamp indicate neutral position has been adopted, and the speedometer must be illuminated whenever the headlamp is activated. Because turn signals and upper beam indicators are covered in Standard No. 108, they have been omitted from the display illumination requirements of Standard No. 123.

Proposals for control identification, stands, and passenger foot-rests have been adopted substantially as proposed. Since operating instructions are invariably provided with motorcycles, the NHTSA has not adopted the proposal covering them.

*Effective date:* September 1, 1974. Because of the leadtime necessary for preparation for production, it is found, for good cause shown, that an effective date later than one year after the issue date is in the public interest.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by adding § 571.123, Motor Vehicle Safety Standard No. 123, *Motorcycle Controls and Displays*, as set forth below.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on April 4, 1972.

Douglas W. Toms  
Administrator

37 F.R. 7207

April 12, 1972



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 123

### Motorcycle Controls and Displays

This notice responds to petitions for reconsideration of Motor Vehicle Safety Standard No. 123 (49 CFR § 571.123) and amends the standard in minor respects.

Motor Vehicle Safety Standard No. 123, establishing requirements for the location, operation, identification, and illumination of motorcycle controls and displays, effective September 1, 1974, was published on April 12, 1972 (37 F.R. 7207). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the rule were filed by Japan Automobile Manufacturers Association, Inc. ("JAMA"), Kawasaki Motors Corp. (Kawasaki), and Cushman Motors ("Cushman") through counsel. In response to these petitions the standard is being revised in minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Manual fuel shutoff valve.* Standard No. 123 requires that the manual fuel shutoff control point downward when in the "on" position, forward in the "off" position, and upward to supply fuel from a reserve source if one is provided.

JAMA has requested that the configuration found on most Japanese motorcycles be adopted: "off" with the control position to the left, "reserve" to the right, and "on" downward. JAMA's request was originally made in response to the notice proposing control positions for the shut-off valve, and was considered at that time. JAMA's petition is denied. The NHTSA has determined that the control should be standardized by requiring its operation along a longitudinal rather than a transverse axis. In this location there is a greater likelihood that in the event of a crash, the control will be carried by inertia to the off position, thereby shutting off the fuel.

JAMA also asked for an interpretation of the words "control pointing" asking if the words

mean the direction of a non-operational pointer indicating the off-position, or the direction of the control end operated by the fingers. "Control pointing" means the direction of the control end operated by the fingers. To eliminate this possible ambiguity, the word "pointing" is deleted from the entry in Table I.

2. *Headlamp control.* The NHTSA requires, in Standard No. 123, that the upper headlamp beam be activated with an upward motion of the beam control, and the lower beam by a downward motion. Kawasaki has asked that these positions be reversed. It reasons that when the left thumb is under the handlebar, the lower beam control can be more quickly activated with an upward movement of the thumb, rather than by raising the thumb above the switch and then depressing it. The Administration denies Kawasaki's request, as it is considered contrary to good human factors engineering. Control mechanisms which are used for increasing the output of a system are generally designed to be switched upward for higher intensity.

3. *Speedometer graduations.* Both JAMA and Kawasaki have petitioned for reconsideration of the requirement that major and minor graduations and numerals appear at the 10 and 5 mph intervals respectively, alleging that operator confusion could be caused by a clutter of numerals and graduations at 5 mph intervals. The NHTSA considers these petitions to have merit and is amending Standard No. 123, to require only minor graduations at the 5 mph intervals.

4. *Control identification.* JAMA has petitioned for an amendment of Table 3 to eliminate identification of some controls and to identify only control positions. The petition also requested abbreviation of the identification presently required. JAMA alleges difficulty in providing all the identification marks due to lack of

space around the handlebar. It argues that an individual operator will not mistake one equipment item for another on different cycles when all controls are uniformly located as specified by Standard No. 123.

The Administration denies JAMA's petition. Labeling control positions without identifying the control itself could confuse the novice motorcyclist and may contribute to traffic hazards. During the initial learning stage the cyclist will not be able to identify controls by their required location. Further, there are no common abbreviations with universal acceptance for the controls mentioned, *viz.*, choke, starter, horn, and neutral indicator.

JAMA also requested a clarification as to whether control identification must be indicated in capital letters. The answer is no: use of upper or lower case lettering is at the manufacturer's discretion. Kawasaki asked whether it is permissible to add information to the tachometer identification indicating that it registers thousands of revolutions per minute. The marking requirements of the standard are minimum requirements only, and the NHTSA has no objection to further identification of this nature for the tachometer.

5. *Three-wheeled motorcycles.* Cushman manufactures three-wheeled motorcycles. It alleged that many of the requirements of Standard No. 123 are incompatible with the configuration of its vehicle. It requested that Standard No. 123 be amended to exclude three-wheeled motorcycles that are designed to achieve a maximum speed no greater than 40 mph. Cushman raised a number of specific objections concerning control location and operation, identification, and displays. In view of the disposition of Cushman's petition it is not necessary to discuss the objections in detail.

Cushman's petition is denied for the following reasons. Petitioner manufactures two types of three-wheeled vehicles, identical except for steering configuration. One type employs handlebars, the other a steering wheel. Its sales literature indicates that most models manufactured with handlebars are intended for industrial applications on private property, and are not intended to be licensed as motor vehicles for use on the public roads. The remaining models manufactured with handlebars are intended for police use. Standard No. 123 does not apply to this type of vehicle. Cushman's models intended for street use are equipped with the steering wheel as standard equipment. The standard does not apply to motorcycles with steering wheels. A denial of Cushman's petition means only that, after September 1, 1974, three-wheeled motorcycles for street use may not be sold with the handlebar option.

6. *Miscellaneous.* A typographical error is corrected concerning the integrated clutch and gear change.

In consideration of the foregoing, 49 CFR § 571.123, Motor Vehicle Safety Standard No. 123, is revised . . . . *Effective date:* September 1, 1974, the same effective date as the standard as previously issued (37 F.R. 7207).

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on August 22, 1972.

Douglas W. Toms  
Administrator

37 F.R. 17474  
August 29, 1972



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 123**

**(Docket No. 74-16; Notice 2)**

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distances values for the various tests would be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars*. As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by

some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.



The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor-driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unneces-

sary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown that an effective date earlier than 180 days after issuance of the amendments is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on September 6, 1974.

James B. Gregory  
Administrator

**39 F.R. 32914**  
**September 12, 1974**

## MOTOR VEHICLE SAFETY STANDARD NO. 123

### Motorcycle Controls and Displays

(Docket No. 70-26; Notice 3)

**S1. Scope.** This standard specifies requirements for the location, operation, identification, and illumination of motorcycle controls and displays, and requirements for motorcycle stands and footrests.

**S2. Purpose.** The purpose of this standard is to minimize accidents caused by operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

**S3. Application.** This standard applies to motorcycles equipped with handlebars, except for motorcycles that are designed, and sold exclusively, for use by law enforcement agencies.

**S4. Definitions.** "Clockwise" and "counter-clockwise" mean opposing directions of rotation around following axes, as applicable:

(a) The operational axis of the ignition control, viewed from in front of the ignition lock opening;

(b) The axis of the right handlebar on which the twist-grip throttle is located, viewed from the end of that handlebar;

(c) The axis perpendicular to the center of the speedometer, viewed from the operator's normal eye position.

#### **S5. Requirements.**

**S5.1** Each motorcycle shall be equipped with a supplemental engine stop control, located and operable as specified in Table I.

**S5.2** Each motorcycle to which this standard applies shall meet the following requirements:

**S5.2.1 Control location and operation.** If any item of equipment listed in Table 1, Column 1, is provided, the control for such item shall be located as specified in Column 2, and operable

as specified in Column 3. Each control located on a right handlebar shall be operable by the operator's right hand throughout its full range without removal of the operator's right hand from the throttle. Each control located on a left handlebar shall be operable by the operator's left hand throughout its full range without removal of the operator's left hand from the handgrip. If a motorcycle with an automatic clutch is equipped with a supplemental rear brake control, the control shall be located on the left handlebar. If a motorcycle is equipped with self-proportioning or anti-lock braking devices utilizing a single control for front and rear brakes, the control shall be located and operable in the same manner as a rear brake control.

**S5.2.2 Display illumination and operation.** If an item of equipment listed in Table 2, Column 1, is provided, the display for such item shall be visible to a seated operator under daylight conditions, shall illuminate as specified in column 2, and shall operate as specified in Column 3.

**S5.2.3 Control and display identification.** If an item of equipment listed in Table 3, Column 1, is provided, the control for such item shall be identified by the word or words shown in Column 2 and any corresponding word in Column 3, placed on or adjacent to the control.

Control positions shall be identified as specified in Column 3, to signify the function performed at that setting. The abbreviations used in Columns 2 and 3 are minimum requirements and appropriate words may be spelled in full. Identification shall appear to the operator in an upright position.

Functional identification need not be provided for equipment items with no entry in Column 3.

**S5.2.4 Stands.** A stand shall fold rearward and upward if it contacts the ground when the motorcycle is moving forward.

**S5.2.5 Footrests.** Footrests shall be provided for each designated seating position. Each footrest for a passenger other than an operator shall fold rearward and upward when not in use.

TABLE 1.—Motorcycle Control Location and Operation Requirements

Equipment Control	Location	Operation
<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>
1. Manual clutch or integrated clutch and gear change	Left handlebar	Squeeze to disengage clutch.
2. Foot operated gear change	Left foot control	An upward motion of the operator's toe shift transmission toward lower numerical gear ratios (commonly referred to as "higher gears"), and a downward motion toward higher numerical gear ratios (commonly referred to as "lower gears"). If three or more gears are provided it shall not be possible to shift from the highest gear directly to the lowest gear, or vice versa.
3. Headlamp upper-lower beam	Left handlebar	Up for upper beam, down for lower beam. If combined with the headlight on-off switch, means shall be provided to prevent inadvertent actuation of the "off" function.
4. Horn	Left handlebar	Push to activate.
5. Turn signal lamps	Handlebars	"Off"—counterclockwise from other positions.
6. Ignition		"Off-control forward, "On"-control downward, "Reserve" (if provided)-control upward.
7. Manual fuel shutoff control		
8. Twist-grip throttle	Right handlebar	Self-closing to idle in a clockwise direction after release of hand.
9. Supplemental engine stop	Right handlebar	
10. Front wheel brake	Right handlebar	Squeeze to engage.
11. Rear wheel brakes	Right foot control <sup>1</sup>	Depress to engage.
	Left handlebar permissible for motor-driven cycles.	

<sup>1</sup> See S5.2.1 for requirements for vehicles with a single control for front and rear brakes, and with a supplemental rear brake control.

TABLE 2.—Motorcycle Display Illumination and Operation Requirements

Display	Illumination	Operation
<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>
1. Speedometer	Yes	The display is illuminated whenever the headlamp is activated.
2. Neutral indication	Green display lamp	The display lamp illuminates when the gear selector is in neutral position.

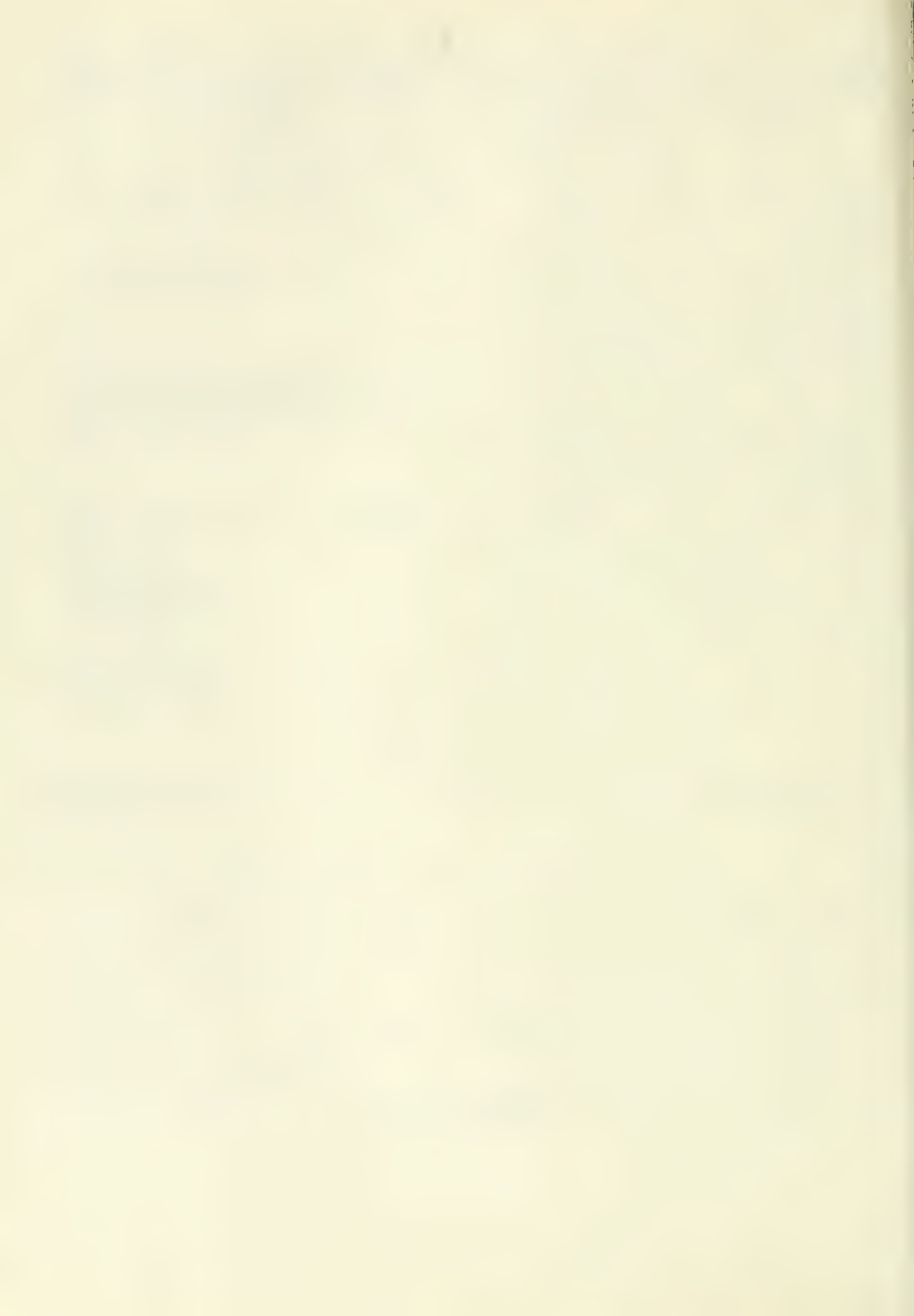


TABLE 3.—Motorcycle Control and Display Identification Requirements

Equipment	Control and Display Identification	Identification at Appropriate Position of Control or Display
<i>Column 1</i>	<i>Column 2</i>	<i>Column 3</i>
1. Ignition	Ignition	Off
2. Supplemental engine stop	Engine stop	Off, run
3. Manual choke	Choke	
4. Electric starter		Start <sup>1</sup>
5. Headlamp upper-lower beam control	Lights	Hi, Lo
6. Horn	Horn	
7. Turn signal	Turn	L,R
8. Speedometer	M.P.H.	M.P.H. increase in a clockwise direction. Major graduations and numerals appear at 10 mph intervals, minor graduations at the 5 mph intervals. (37 F.R. 17474—August 29, 1972. Effective: 9/1/74)
9. Neutral indicator	Neutral	
10. Upper beam indicator	High beam	
11. Tachometer	R.P.M.	
12. Fuel tank shutoff valve	Fuel	Off, on, res.

<sup>1</sup>Required only if electric starter is separate from ignition switch.

37 F.R. 7207  
April 12, 1972



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 124

### Accelerator Control Systems

(Docket No. 69-20; Notice 3)

The purpose of this notice is to establish a new motor vehicle safety standard that specifies requirements for accelerator control systems of passenger cars, multi-purpose passenger vehicles, trucks and buses.

A notice of proposed rulemaking on this subject was published September 30, 1970 (35 F.R. 15241). The majority of comments received supported the proposal. There were some objections and questions, which have been considered in formulating the final rule.

In the previous notice, the Administrator indicated the importance of this standard in reducing the number of accidents caused by runaway engines. Since 1966, sixty recall campaigns totalling over 2.9 million vehicles have involved this problem. Three percent of all complaints in the Administration's files have reported malfunctioning accelerator or carburetor systems. Because the ability of a driver to control his vehicle is directly related to the proper functioning of the accelerator control system, it is essential that this system perform as expected, especially when the driver removes the actuating force. Therefore, the standard sets requirements to ensure the reliability of accelerator control systems over a wide range of driving conditions. Each system must include two independent sources of energy (such as springs) which shall return the throttle to idle upon the removal of the actuating force. In the case of breakage or disconnection in the accelerator system, the throttle shall return to idle either at the time of breakage or at the removal of the actuating force.

The latter requirement differs from the NPRM, which mandated a return to idle only when the actuating force was removed. Industry com-

ments raised valid objections to this requirement. In some cases, if a breakage occurred and the system had to keep operating until the driver took his foot off the pedal, a complicated system of sensors would have to be built into the throttle which would activate the redundant energy sources precisely at the time of actual removal. Such a device would be too expensive for its possible safety benefit, since the incidence of accidents from engine loss of power are minimal when compared with runaway overspeed statistics. Manufacturers, therefore, have been given the option to use either return-to-idle mode.

Although many comments suggested modification of the temperature range, the ambient temperature levels in the NPRM are retained. A review of meteorological data indicates that these figures conform to possible driving conditions in various areas of the United States.

There are four other proposed requirements in the NPRM that are not included in the final rule. These are the 300-pound force requirement, the coverage of automatic speed control systems, the freedom-of-movement requirement, and the coverage of motorcycles.

Several commenters raised objections to the 300-pound overforce, and some asked for a lesser force than 300 pounds. It was found on review that the safety benefits of an overforce test has not been demonstrated sufficiently and the requirement has been dropped from the rule.

The rule does not contain requirements for automatic speed control devices. It was found that although nine recall campaigns involving 61,176 vehicles have concerned these devices, no relationship to accelerator overspeed accidents could be established from automatic speed controls. Of the 540 multi-disciplinary accident



reports that were studied in formulating the final rule, none mentioned the automatic system. The requirements of the NPRM reiterated SAE recommendations that are already used by manufacturers.

The "freedom-of-movement" paragraph raised the objections of subjectivity and difficulty of implementation. Enforcement through compliance testing would lead to controversy over the imprecise meaning of "necessary chafing." It appears that to comply with the final rule, the accelerator system will have to be free of excessive and unsafe rubbing and friction.

The decision to eliminate motorcycles from the applicability of this standard is based on the fact that motorcycles are so different in design from the other vehicles covered that definitions and failure modes are dissimilar. Also, a safety standard specifically tailored for motorcycle controls (Docket 70-26) will be issued this year.

This issue of the Federal Register contains a Notice of Proposed Rule-making to amend Standard No. 124 (37 F.R. 7108). The proposal is that the two independent sources of energy would return the throttle idle within one half second after the removal of the actuating force or a breakage or disconnection in the accelerator control system.

This standard is directed at the hazard caused by a failure in the accelerator control system.

Those engine overspeed incidents caused by other failure modes such as broken or worn engine mounts are not addressed by this rulemaking action. The NHTSA is presently developing performance requirements for safety under other failure modes.

In consideration of the foregoing, Part 571 of Title 49, Code of Federal Regulations, is amended by adding a new § 571.124, Motor Vehicle Safety Standard No. 124, as set forth below.

*Effective Date:* September 1, 1973.

Because of the development work and preparation for production that this standard will require, it is found that an effective date later than 1 year from the date of issuance is in the public interest. Accordingly, the standard is effective September 1, 1973.

This rule is issued under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on March 31, 1972.

Douglas W. Toms  
Administrator

37 F.R. 7097  
April 8, 1972

# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 124**

## **Accelerator Control Systems**

**(Docket No. 69-20; Notice 5)**

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 124 (49 C.F.R. 571.124), and to amend the standard to specify time requirements for the return of a vehicle's throttle to the idle position.

On April 8, 1972 (37 F.R. 7097), Motor Vehicle Safety Standard No. 124 was published, establishing requirements for accelerator control systems, effective September 1, 1973. Simultaneously, a notice was published (37 F.R. 7108) proposing that when the driver removes the actuating force from the accelerator control or in the event of a breakage or disconnection in the accelerator control system, the return to idle position shall occur within one-half second.

I. Pursuant to 49 C.F.R. 553.35, petitions for reconsideration of the rule were filed by Alfa Romeo, American Automobile Association (AAA), American Motors Corporation, Chrysler Corporation, Diamond Reo Trucks, Incorporated, Ford Motor Company, General Motors Corporation (GM), International Harvester Company, Japan Automobile Manufacturers Association (JAMA), Jeep Corporation, Jesse R. Hollins, Mack Trucks, Incorporated, MacMillan Engineering Lab, Motor Vehicle Manufacturers Association of the United States, Incorporated, (MVMA) (formerly Automobile Manufacturers Association, Incorporated), and Rolls-Royce Motors Limited.

Favorable consideration has been granted to some of these petitions, and accordingly, the standard is being amended in some minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

GM and Ford requested that vehicles over 10,000 pounds GVWR be exempted from the standard, while Mack and Diamond Reo requested an exemption for vehicles of 26,000 and 25,000 pounds or more GVWR, respectively. Petitioners argued that since these vehicles are driven by professionally trained drivers, are equipped with engine governors, have a horsepower to weight ratio that does not mandate a fail-safe requirement, and have not been the subject of a defect notification campaign, there is no need for the rule's applicability.

The NHTSA denies petitioners' request. Available information shows that accidents resulting from throttle failure do not occur only among the less experienced drivers, nor are they diminished by the presence of engine governors or by changes in the horsepower to weight ratio. Further, these vehicles have been the subject of defect notification campaigns, and accident reports submitted to the Bureau of Motor Carrier Safety disclose that an average of two accidents occur per month in which the cause is attributed to "overspeed incidents", indicating the type of failure the standard is designed to eliminate.

Additionally, GM stated that the standard's test requirements are not justified by the possible additional safety benefit that may accrue. They argued that the only method by which it could assure compliance is by immersion of the entire vehicle in a low temperature cell. GM stated that sufficient facilities to conduct such tests on all their vehicles are not available, and even if they were, the test burden is impracticable because of the complications of determining where over the length of the vehicle the ambient temperature measurements should be taken.



The NHTSA does not view Standard No. 124 as a qualification procedure by which a manufacturer can assure himself or his customers that the vehicle now has a fail-safe system. The rule is intended to provide a minimum performance requirement, and does not mandate that assurances of being in compliance must be made by immersing the total vehicle in a low temperature cell. Assurances of compliance may come from other procedures.

Several petitioners provided data showing that it is a common practice in the automobile industry to include the "throttle lever" or "actuating lever" as part of the carburetor. They ask that these devices be interpreted to be part of the fuel metering device so as to afford them greater freedom of design.

The NHTSA agrees with this interpretation. The "throttle lever" or "actuating lever" as described by the petitioners is a component of the fuel metering device.

Additionally, several petitioners requested that the definition of "idle position" be amended to take into consideration delay units or "dash pots" which are frequently used on idle settings to slow the return of the throttle during its last few degrees of rotation to prevent stalling and excessive exhaust emissions. In essence, petitioners request that the return to idle time be measured to the point at which the throttle first comes in contact with the delay unit or "dash pot." This request is in accordance with the intended meaning of the standard. For clarification, the NHTSA is amending the definition of "idle position" to be the specific point of throttle closure at which the throttle first comes in contact with an engine idle speed control device.

Mack and Alfa Romeo petitioned that "hand throttles" and throttle positioners be specifically excluded from the definition of "idle position". Petitioners stated that in the event such a device is used a return to the preset throttle position occurs upon release of the driver-operated accelerator control system. This request is granted. If a driver chooses to raise the lowest engine speed threshold by the use of a throttle positioning device, the throttle should return to that new position within the same time requirements specified in section S5.3. Accordingly, the NHTSA

is amending the definition of "idle position" to provide for the use of throttle positioners.

JAMA requested that the engine warm-up provisions for cold temperatures be clarified, so that it would be possible to conduct tests "after warming up the engine according to the manufacturer's recommendation." Standard No. 124 is silent as to engine warm-up, and states only "when the engine is running" as a condition for the test. Although the advantages of following the manufacturer's warm-up procedures are recognized, it is felt that in most instances the driving public does not adhere to those recommendations. Therefore, to afford the driving public as broad a coverage of the rule as is possible, JAMA's petition is denied.

AAA and Chrysler petitioned for an amendment of the ambient temperature range. AAA urged that since colder temperatures are commonplace in Alaska and that hotter temperatures are used by vehicle manufacturers to test fuel system control devices, a more severe temperature range should be established. Chrysler stated that the minus 40 degree figure exceeds automotive practice by 30 degrees and asked that a performance level of minus 10 degrees be established.

In determining the temperature limits to be used, the NHTSA attempted to provide motor vehicle safety without establishing impracticable design goals. Weather data discloses that although temperatures of minus 40 degrees Fahrenheit are encountered in many parts of the United States, colder temperatures are unusual. For this reason, minus 40 degrees Fahrenheit was determined to be the lowest temperature consistent with the needs of motor vehicle safety. Conversely, vehicle operations in temperatures exceeding 125 degrees Fahrenheit are also unusual. Accordingly, it was determined that temperature limits of minus 40 degrees to plus 125 degrees Fahrenheit will allow for most climatic conditions encountered in the United States. The petitions are therefore denied.

Several petitioners asked for an interpretation of the phrase "The system shall include at least two sources of energy" in section S5.1 and whether it includes energy sources attached to the fuel metering service. Petitioners stated



that a strict interpretation would cause excessive design restrictions. If a return spring attached to the fuel metering device is capable of returning the throttle to its idle position after the failure of other energy sources, it meets the intent of the standard and should not be disallowed. Accordingly, paragraph S5.1 is amended by replacing the phrase "The system shall include at least two sources of energy" with "There shall be at least two sources of energy".

JAMA asked whether, if a system includes three or more springs, each spring must be independently capable of returning the throttle to the idle position. They argued that a system could still remain adequately fail-safe as long as the other springs operating together can meet the requirements. The intent of paragraph S5.1 is to eliminate the driver's dependence on a single accelerator return spring. The NHTSA concurs with JAMA's comments and is amending paragraph S5.1 to make it clear that independent capability of return springs is not required if remaining energy sources are collectively capable of returning the throttle to the idle position.

The standard as issued required that the throttle return to the idle position "whenever any element of the accelerator control system becomes disconnected or broken." Several petitioners seek an interpretation of this wording. GM suggested that a disconnection or breakage within the driver-operated accelerator control system was the only failure mode addressed by the standard. Ford asked whether the requirement was intended to cover failures caused by bending, twisting, jamming, or introduction of foreign matter. The NHTSA's intent is to assure safety under conditions of a single failure due only to a severing or disconnection in the accelerator control system. To clarify this interpretation, the NHTSA is changing the word "breakage" to "severance" in paragraph S1, and the word "broken" to "severed" in the first sentence of paragraph S5.2. Further, the phrase "whenever any element of the accelerator control system" is changed to "whenever any one component of the accelerator control system" for purposes of clarification.

Ford and JAMA petitioned that the effective date of the standard be delayed one year. Peti-

tioners stated that additional time was necessary to allow for the creation and confirmation of design changes and to resolve any conflicts with emission control requirements.

The NHTSA considers the complexity of the requirements of standard No. 124 to be minimal and has granted relief on several issues effecting design time, and therefore sees no justification for delaying the effective date of the standard. The petitions are denied.

II. On April 8, 1972 (37 F.R. 7108) a notice was published proposing that when the driver removes the actuating force from the accelerator control or in the event of a breakage or disconnection in the accelerator control system, the return to idle position shall occur within one-half second. Available information indicates that in most instances the time for driver reaction from the accelerator control pedal to the brake is approximately one-half second, and this time was chosen for the proposal. In response to the notice, many commentators objected to the one-half second proposal and stated that it did not adequately take into consideration the viscous nature of lubricants in extremely cold temperatures and the impracticability of this time requirement for the very large systems in heavy trucks and buses. The NHTSA recognizes the validity of these objections, and allowances have accordingly been made for extreme low temperature. An idle time of 3 seconds is established for any vehicle tested or conditioned in ambient air of 0 degrees Fahrenheit or colder.

Large systems, similar to those used on rear-engine buses, have sufficient mass and friction to preclude the possibility of compliance with the one-half second proposal, unless very high spring forces, which would require large changes in pedal forces, are used. Several commentators stated that tests for conformity with the proposed requirements show that compliance would be possible if the maximum time were extended to 2 seconds. The NHTSA finds these comments to have merit, and 2 seconds is established as the maximum return time for vehicles with a GVWR over 10,000 pounds.

Many comments pertaining to passenger car systems stated that the one-half second proposed is too severe a requirement. One commentator

stated that extra time will be required if one of the return energy sources fails. It was pointed out that precedent for an extra allowance can be found in the dual braking system requirement, which allows added distance for stopping when half the system has failed. The accelerator standard, however, does not deal with a mechanism with the same redundancy as the braking system and it is felt that the maximum time selected should allow for the possibility of one energy source failing.

There are a large number of models and engine sizes in the passenger car industry, and a large number of variety of accelerator control systems are designed and built each year. One commentator suggested that "... a one second time limit would considerably increase design options ..." and "presently accepted pedal feel can be retained. ..." Accordingly, one second has been decided upon as having the qualities of providing a reasonable maximum time for compliance testing of vehicles of 10,000 pounds or less GVWR at temperatures above 0 degrees Fahrenheit.

In response to questions raised by several petitioners, "ambient temperature is defined as the surrounding air temperature, at a distance such that it is not significantly affected by heat from the vehicle under test. The definition contrasts the ambient temperature, intended to simulate a general outdoor temperature, from temperatures under the hood or otherwise in close proximity to the vehicle.

In consideration of the foregoing, 49 CFR 571.124, Motor Vehicle Safety Standard No. 124, is revised to read as set forth below.

Effective date: September 1, 1973.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on September 20, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 20033**  
**September 23, 1972**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 124****Accelerator Control Systems****(Docket No. 69-20; Notice 6)**

The purpose of this notice is to respond to petitions for rulemaking to amend and petitions for reconsideration of Motor Vehicle Safety Standard No. 124 (49 CFR 571.124).

On September 23, 1972 (37 F.R. 20033), Motor Vehicle Safety Standard No. 124 was published specifying time requirements for the return of a vehicle's throttle to the idle position. Pursuant to 49 CFR 553.35, petitions for reconsideration were filed by Japan Automobile Manufacturers Association, Inc. (JAMA) and Volkswagen of America, Inc. Additionally, pursuant to 49 CFR 553.31, a petition for rulemaking to amend the standard was filed by the Ford Motor Company.

Favorable consideration has been granted to some of the requests and accordingly, the standard is being amended in some minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

Volkswagen requested that the test requirements for cold temperatures be clarified, in order to determine whether it is possible to use supplementary starting devices and to "pump" the accelerator control pedal during and after the presoak and prior to the test. The advantages of using supplementary devices and warmup procedures are recognized, but in many instances, the driving public either does not adhere to the manufacturer's recommended warmup procedures or uses other procedures. The intent of the standard is to afford the driving public as broad a coverage of the rule as is possible, by simulating as closely as possible actual conditions. Accordingly, for purposes of testing compliance the engine may be started by the use of any supplementary starting devices and procedures except those which would induce the vehicle into motion by the application of an external force.

Volkswagen also asked the NHTSA to define the speed at which the accelerator pedal is "to be released" to mark the beginning of the test determining the return of the throttle to idle position. The agency's intent is to provide protection in the variety of situations that may be encountered on the road. The vehicle, therefore, must be capable of meeting the requirements no matter how rapidly or slowly the driver's foot is lifted from the pedal. The actuating force actually is not "removed" from the pedal until the foot is no longer in contact with it, so the measured time period for throttle return does not begin until the instant when the foot leaves the pedal.

Further, Volkswagen asked the NHTSA to define a "running engine." Volkswagen stated that during cold testing an engine could start, run for approximately 6 seconds, and then stall. Volkswagen theorized that it would be possible to have an accelerator system fail the test requirements during this 6-second interval, although the engine would be incapable of causing a safety problem. The phrase "engine running" defines a condition without which throttle return to idle position has no significance. The intent of the standard is to prevent any safety problems caused by faulty throttle return over a broad range of operating circumstances and temperature conditions. The condition of a running engine, regardless of torque produced, is a clearly definable point at which a safety problem could begin to occur. Therefore, the vehicle must be capable of meeting the requirements whenever the engine is rotating without the application of any external force.

JAMA requested that the time requirements for maximum return to idle position when tested in temperatures between 0 and minus 40 degrees



Fahrenheit be applied "only when there is no failure of the source of energy and no disconnection or severance of components." JAMA stated that in order for a system to meet the time requirements of the rule during cold testing, the "required pedal effort would be increased to an extent that would not be acceptable to the ordinary driver." In its earlier comments to Notice 3, (37 F.R. 7097), JAMA stated that if each energy source was independently required to return the throttle to idle within the specified time requirements, increased pedal forces would be necessary. In response to this comment and to allow a manufacturer design freedom, the standard was amended by Notice 5, (37 F.R. 20033), to specify that independent capability of energy sources to return the throttle to idle position was not required. The amendment also gave an additional time allowance for return to idle position for vehicles tested or conditioned in cold temperatures. Based on these factors and on the comments received from other manufacturers, this agency's position is that the standard provides enough latitude for a manufacturer to feasibly meet the pedal force requirements and the time requirements for return to idle, even if there is a failure of one source of energy or a severance or disconnection occurs. The petition is therefore denied.

Ford pointed out that under the requirements section, S5.1 states that, "There shall be at least two sources of energy" and that this seemed at variance with the intent expressed in the preamble to Notice 5 that energy sources do not have to be contained in the accelerator control system. To further clarify the intent expressed in Notice 5, the phrase in S.5 "The vehicle shall be equipped

with a driver-operated accelerator control system that meets the following requirements" is changed to "The vehicle shall meet the following requirements . . . ."

Ford also asked for a clarification of the word "failure" in S5.1. Ford stated that the word was ambiguous in that it would allow for abnormal operating conditions outside the scope of the standard's intent to assure safety under conditions of a single failure due to a severance or disconnection in the system. To clarify the standard's intent, the phrase in S5.1 which states that, "In the event of failure of one source of energy the remaining source or sources shall be capable of returning the throttle" is changed to "In the event of failure of one source of energy by a single severance or disconnection, the throttle shall return . . . ."

Further, in the first sentence of S5.2 the word "becomes" is changed to "is" and the phrase "at a single point" is added to the end of the sentence to clarify this meaning.

In consideration of the foregoing, 49 CFR 571.124, Motor Vehicle Safety Standard No. 124, is revised to read as set forth below.

Effective date: September 1, 1973.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 24, 1973.

Douglas W. Toms  
Administrator

**38 F.R. 2980**  
**January 31, 1973**

## MOTOR VEHICLE SAFETY STANDARD NO. 124

### ACCELERATOR CONTROL SYSTEMS

(Docket No. 69-20; Notice 3)

**S1. Scope.** This standard establishes requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a severance or disconnection in the accelerator control system.

**S2. Purpose.** The purpose of this standard is to reduce deaths and injuries resulting from engine overspeed caused by malfunctions in the accelerator control system.

**S3. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

#### **S4. Definitions.**

**S4.1** "Driver-operated accelerator control system" means all vehicle components, except the fuel metering device, that regulate engine speed in direct response to movement of the driver-operated control and that return the throttle to the idle position upon release of the actuating force.

"Fuel metering device" means the carburetor, or in the case of certain engines, the fuel injector, fuel distributor, or fuel injection pump.

"Throttle" means the component of the fuel metering device that connects to the driver-operated accelerator control system and that by input from the driver-operated accelerator control system controls the engine speed.

"Idle position" means the position of the throttle at which it first comes in contact with an engine idle speed control appropriate for existing conditions according to the manufacturer's recommendations. These conditions include, but are not limited to, engine speed

adjustments for cold engine, air conditioning, and emission control, and the use of throttle setting devices.

"Ambient temperature" means the surrounding air temperature, at a distance such that it is not significantly affected by heat from the vehicle under test.

**S4.2** In the case of vehicles powered by electric motors, the word "throttle" and "idle" refer to the motor speed controller and motor shutdown, respectively.

**S5. Requirements.** The vehicle shall meet the following requirements when the engine is running under any load condition, and at any ambient temperature between minus 40° Fahrenheit and plus 125° Fahrenheit after 12 hours of conditioning at any temperature within that range.

**S5.1** There shall be at least two sources of energy capable of returning the throttle to the idle position within the time limit specified by S5.3 from any accelerator position or speed whenever the driver removes the opposing actuating force. In the event of failure of one source of energy by a single severance or disconnection, the throttle shall return to the idle position within the time limits specified by S5.3, from any accelerator position or speed whenever the driver removes the opposing actuating force.

**S5.2** The throttle shall return to the idle position from any accelerator position or any speed of which the engine is capable whenever any one component of the accelerator control system is disconnected or severed at a single point. The

return to idle shall occur within the time limit specified by S5.3, measured either from the time of severance or disconnection or from the first removal of the opposing actuating force by the driver.

**S5.3** Except as provided below, maximum time to return to idle position shall be 1 second for vehicles of 10,000 pounds or less GVWR, and

2 seconds for vehicles of more than 10,000 pounds GVWR. Maximum time to return to idle position shall be 3 seconds for any vehicle that is exposed to ambient air at 0 to minus 40 degrees Fahrenheit during the test or for any portion of the 12-hour conditioning period.

**37 F.R. 7097**  
**April 8, 1972**



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 125

### Warning Devices

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard No. 125 (49 CFR § 571.125) that would establish shape, size, and performance requirements for warning devices that do not have self-contained energy sources. The devices are carried in motor vehicles and are erected to alert approaching motorists to the presence of a disabled vehicle.

A notice of proposed rulemaking on this subject was published on November 11, 1970 (36 F.R. 17350). The comments received in response to the notice have been considered in this issuance of a final rule.

As noted in the proposed rule, the standard will supplement the vehicular hazard warning signal lamps required by F.M.V.S.S. No. 108, *Lamps, Reflective Devices, and Associated Equipment*, in minimizing the likelihood of rear end collisions between oncoming traffic and disabled vehicles.

The standard is issued as an equipment standard and establishes requirements only for warning devices which do not have self-contained energy sources. Because provision of warning devices in new vehicles is optional, the instructions regarding the number of devices to be used are recommendations, rather than requirements, and the storage location requirement is deleted.

The standard requires that the device be bi-directional, lowers the minimum length of the triangle legs, and increases the permissible deviation from a vertical plane for the triangle when the device is placed on the road. It reduces the required minimum candlepower of the red reflective material and raises the luminance requirement for the orange fluorescent material. It also adds definitions of "reflex reflective," deletes one of the two definitions of the colors "red" and "orange," and deletes one of the two reflectivity

requirements. With respect to the conditioning requirements, the standard lowers the high temperature requirement.

Several of the comments submitted by foreign motor vehicle manufacturers stated that the warning device should conform to the recommendations of international advisory groups. The Economic Commission of Europe (E.C.E.), a United Nations-sponsored council of which twenty-six nations, including the United States, are members, is in the process of developing specifications for warning triangles to be ratified by national governments. The NHTSA has adopted most of the proposed E.C.E. requirements with the exception of the minimum candlepower requirement for wide angle positioning of the device. The NHTSA has determined that a lower minimum candlepower than that required by the E.C.E. provides adequate protection and is a more realistic reflection of the state of the art.

Comments from the domestic automobile industry objecting to mandatory provision of warning devices stated that available information does not justify the additional cost of supplying them in new vehicles. The NHTSA has concluded that it is necessary to collect further data regarding effectiveness of warning devices and frequency of use by consumers so that more accurate cost-benefit analyses may be made. For these reasons, the provision of warning devices has been made optional by issuing an equipment standard.

Numerous manufacturers of fusees submitted comments which described the merits of fusees and concluded that the proposed rule would prohibit the use of fusees. Neither the rule as issued nor the proposed rule applies to devices which have a self-contained energy source, such as fusees, flare pots, and electric lanterns. Thus

these devices may continue to be used as an alternative or a supplement to the device described in the standard.

Numerous comments from private citizens and State officials expressed concern that the required triangular shape of the warning device would prohibit the triangular Slow Moving Vehicle emblem currently used on many motor vehicles. Other comments supported the use of the triangular device because the triangular shapes would be used for similar purposes, to alert oncoming traffic that a reduction of speed is necessary due to a vehicle ahead. The Administration supports the dual use of the triangular symbol and it is intended that the warning device and the Slow Moving Vehicle emblem be complementary. As discussed in the notice of proposed rulemaking, State laws regarding slow moving vehicle emblems would be preempted by the standard only to the extent that they forbid the use of the triangular warning device intended by the standard.

Many comments recommended that the warning device be bi-directional in order to eliminate the possibility of placing the warning device with the non-reflective side facing oncoming traffic. It was pointed out that the increased cost of a bi-directional device over a unidirectional device would be minimal relative to the safety benefits provided. The NHTSA agrees, and accordingly the standard as issued requires the device to be bi-directional.

Some commenters felt that the motorist would subject himself to an additional safety hazard in placing the device approximately 100 feet behind the vehicle. Some suggested that the device be placed either on top of the vehicle or be capable of attaching to a window frame. While it is of course true that walking in a roadway can be hazardous, in the judgment of the NHTSA this risk is outweighed by the safety benefits of positioning the device at a distance behind the vehicle. Such positioning provides a greater distance over which oncoming traffic can recognize and respond to the warning and thus affords greater protection to the disabled vehicle.

Figures 3 through 9 indicating recommended positioning of warning devices have been consolidated into a single diagram indicating the suggested placement of the devices.

The permissible deviation from a vertical plane for the triangle when the device is placed on the road has been increased from five degrees to ten degrees in response to comments from manufacturers. The NHTSA has determined that the change will not alter the effectiveness of the device. The required distance above the ground of the lower edge of the triangle has been increased from one-half to one inch to improve the effectiveness of the device when water or mud collects on the roadway.

The minimum length of the legs of the triangle has been lowered from 18 to 17 inches, to correspond to the range of lengths permitted by the Bureau of Motor Carrier Safety.

The minimum width of the red reflective material has been clarified at the request of two manufacturers of reflex reflectors to correspond to industry terminology.

The definitions of the colors "red" and "orange" have been clarified in light of the comments, by the deletion of the definition in terms of nanometers. The NHTSA has concluded that definitions in terms of chromaticity coordinates and purity are sufficient. In order to standardize the requirement with respect to current color specification practice, the required chromaticity coordinates have been changed slightly.

The reflectivity requirement has been clarified to state that the material must be reflex reflective, and a definition of "reflex reflective" has been added to the standard. The reflectivity requirement in terms of candlepower per square inch has been found to be superfluous, and accordingly has been deleted.

The Economic Commission of Europe requested that the required total minimum candlepower per incident foot candle for an observation angle of 0.2 degrees be lowered from 120 candlepower to correspond to the international specifications. The NHTSA has concluded that 80 candlepower will provide sufficient protection and the minimum candlepower has been lowered accordingly.

In order to standardize the requirement with respect to current photometric practice, the luminance requirement for orange fluorescent material in the warning device has been raised from not less than 30 percent to not less than

35 percent of that of a flat magnesium oxide surface. The luminance criterion, "when compared under the light from an overcast sky," has been changed to read "when subjected to a 150-watt high pressure xenon compact arc lamp."

Many equipment manufacturers stated that the 200 degree Fahrenheit requirement for the high temperature conditioning is not justified by evidence showing that the device must withstand temperatures at that level when in use. This contention has been found to have merit, and the temperature requirement has been lowered to 150 degrees.

*Effective date:* January 1, 1974. Because the standard is issued later than anticipated, the effective date has been extended from January 1, 1972 to January 1, 1974. The NHTSA has concluded that this date will permit manufacturers of warning devices which do not have self-contained energy sources and which do not

meet the specifications of the standard to retool for manufacture of complying devices. It is therefore found, for good cause shown, that an effective date more than one year from the date of issuance is in the public interest.

In consideration of the above, a new § 571.125, Standard No. 125, Warning Devices, is added to Title 49, Code of Federal Regulations. . . .

This rule is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on March 1, 1972.

Charles H. Hartman  
Acting Administrator

**37 F.R. 5038**  
**March 9, 1972**





## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 125

### Warning Devices

#### (Docket 4-2; Notice 5)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 125, Warning Devices, in § 571.125 of Title 49, Code of Federal Regulations. The standard was issued on March 1, 1972 (37 F.R. 5038).

The Amerace-Esna Corporation suggested that the 98% purity requirement for the red reflex reflective material be deleted since the trichromatic color coefficients provide sufficient definition of the red color. The NHTSA agrees, and furthermore has determined that the purity requirement for the orange fluorescent material should be deleted for the same reasons. Accordingly, S5.3.1(c) and S5.3.2(c) are deleted from the rule.

Hawes Industries, Inc. requested that the standard permit the use of a triangular warning device designed to be secured on the roof of a motor vehicle. They stated that the roof location was more convenient to the consumer than the recommended positioning behind the car and afforded as much or more protection. As stated in the preamble to the standard, a number of comments advocating positioning of the device on the vehicle roof or side were received and reviewed by the NHTSA in the formulation of the final rule. The Administration determined that placement of the device behind the vehicle would provide maximum protection by affording a greater distance for recognition and response by oncoming traffic. For this reason, it has recommended positioning of the device 100 feet behind the vehicle and requires an illustration indicating this location to be provided in the instructions. The standard does not prohibit manufacture or sale of a device capable of being mounted on a vehicle roof, as long as it meets all the Standard 125 requirements, including the capability of being set up on the ground.

The standard requires that an illustration depicting recommended positioning of the device be included with the instructions for the device. The Administration is amending S5.1.5(c) to clarify its intent that the illustration provided be substantially identical to Figure 3.

The standard as issued establishes separate width requirements for red reflex reflective material and orange fluorescent material affixed to the faces of the warning device. Rowland Development Corporation stated that it manufactures a "dual purpose fluorescent orange-red reflective material," and requested that the separate width requirements be suspended when such material is used. The request appears to have merit, but NHTSA has concluded that an evaluation of the requirements pertaining to the fluorescent orange material is necessary before it can respond to this request. A notice of proposed rulemaking containing proposed changes will be issued when the evaluation is completed. When the final revised requirements for the fluorescent material are established, a precise definition of the dual purpose material can be formulated.

Prof. D. M. Finch of the University of California stated that in order to clarify the color requirements the respective sources of illumination for the measurement of the red and orange color should be specified. The NHTSA agrees that this should be done, and accordingly S5.3.1 has been modified to specify the use of a lamp with a tungsten filament operating at 2,854° K for the red measurement. The source of illumination for the measurement of the orange color will be specified with the revision of the fluorescent material requirements referred to above.

The word "tungsten" is inserted before the word "filament" in the rule, as a clarification of the test conditions for red color and reflectivity.

**Effective: January 1, 1974**

In consideration of the foregoing, Motor Vehicle Safety Standard No. 125, Warning Devices, 49 CFR § 571.125, is amended. . . .

*Effective date:* January 1, 1974.

This notice is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401,

1407) and the delegation of authority at 49 CFR 1.51.

Issued on June 19, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 12323**  
**June 22, 1972**



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 125**

## **Warning Devices**

**Docket No. 4-2; Notice 6)**

The purpose of this notice is to respond further to petitions for reconsideration and amendment of Motor Vehicle Safety Standard No. 125, Warning Devices, § 571.125 of Title 49, Code of Federal Regulations. The standard was issued on March 1, 1972, (37 F.R. 5038). On June 22, 1972, a previous notice of amendments and reconsideration of the standard was published (37 F.R. 12323).

With respect to the configuration of the device Rowland Development Corporation stated that it manufactures a dual purpose fluorescent orange and red reflective material and requested that the separate width requirements for red reflex reflective material and orange fluorescent material affixed to the faces of the device be suspended when such material is used. The NHTSA has concluded that the use of such dual purpose material as an alternative to separate material is permissible if the material is capable of meeting the requirements of Standard 125. S5.1.1, S5.2.3, S5.5, and S6.2(a) are hereby modified accordingly, and the separate width requirements will not be applicable when dual purpose material is used.

Tri-Lite interpreted the standard as permitting the use of a flag as part of a "combination signal device" as long as the device did not violate S5.2.1(b), relating to obstruction of the reflective and fluorescent material. In a previous letter to Tri-Lite the NHTSA had stated that the standard would be interpreted to allow such additions. (Docket entry N4-4-2-10, July 18, 1972.) Upon further consideration, the agency has determined that permitting additions to the device will lessen its effectiveness by degrading the uniformity of its shape. Accordingly, the use of additional shapes or attachments will not be permitted, and a new S5.2.6 is added to that effect.

A number of petitions regarding the orange fluorescent material were received. Personnel from the National Bureau of Standards suggested that the requirements for the color of the orange fluorescent material be amended so as not to penalize colors that have the same hue but are stronger than the present maximum y and minimum x values. The NHTSA agrees with the suggestion and S5.3.2 has been amended accordingly.

Tri-Lite stated that the fluorescent material deteriorates over time and is therefore unreliable. It requested that the provision of orange fluorescent material on the device be made optional. The NHTSA recognizes that deterioration of fluorescence is a possibility; however, it is felt that the requirement of an opaque container and the improving technology of fluorescent materials should offset the possible problem. It is anticipated that the device will be used only infrequently, in emergencies, by most drivers. The request of Tri-Lite is therefore denied.

Rowland Corp. requested that the luminance requirement be expressed in terms relative to the amount of fluorescent material affixed to the device rather than the percentage figure of magnesium oxide presently required. The agency position is that a minimum level of luminance is necessary for identifiability, but that a somewhat lower limit for luminance of the orange material could be suitable if more material is used. Accordingly, S5.5 has been amended to lower the minimum relative luminance relative to magnesium oxide from 35% to 25%, and to require a minimum product of that relative luminance and width in inches of the device of 44. Dayglo Color Corp. requested that two sources of light for luminance test, Source C and Source D-65, be permitted in addition to the xenon arc lamp

specified in the standard. The NHTSA has concluded that the most consistent test results are provided when the material is diffusely irradiated with undispersed light from a high-pressure xenon arc lamp to simulate daytime conditions. As a general rule, alternative test procedures for a single property are inadvisable, and no sufficient justification for them has been shown here. Therefore the Dayglo request is denied.

In light of evidence that differing relative luminance values are obtained from different procedures used to measure it, a procedures paragraph (S6.3) for the luminance testing of the orange fluorescent material has been added to the standard. The procedure is adapted from the publication "Colorimetry", of the International Commission on Illumination (CIE Publication No. 15, E-1.3.1, 1971).

Two petitions dealt with the stability requirements. Rowland Development Corporation requested that the standard permit the manufacture of a triangle device constructed of flexible material which is secured at the outer corners of the triangle and is otherwise free to flex with the wind. Safety Triangles Company requested that the device be permitted to tilt to a position up to 30° from the vertical rather than the presently allowed 10°. These requests were directed at permitting manufacturers to produce lighter and cheaper devices. The NHTSA has concluded that if the triangle is permitted to flex in the wind or tilt to a position up to 30° from the

vertical, the attitude of the triangle is altered so that the shape of the equilateral triangle is distorted, thus detracting from one of the goals of the standard. The present performance requirements and the consequent cost factors have been found to be reasonable. These requests are accordingly denied.

With respect to reflectivity testing, Rowland stated that candlepower requirements for an observation angle of 0.2° were superfluous and not related to true highway situations, and requested their deletion. The NHTSA has determined in the formulation of the standard that the specified reflectivity requirements allow a maximum recognition and detection distance to oncoming traffic. Accordingly, the requirements for the 0.2° observation angle are retained.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 125, Warning Devices, 49 CFR § 571.125, is amended. . . .

Effective date: January 1, 1974.

(Sec. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 23, 1973.

Douglas W. Toms  
Administrator

**38 F.R. 2760**  
**January 30, 1973**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 125****Warning Devices****(Docket No. 74-2; Notice 10)**

The purpose of this amendment to Motor Vehicle Safety Standard No. 125 (49 CFR 571.125), Warning Devices, is to prescribe the color specifications for the orange and red materials used in the warning devices authorized under the standard.

On April 6, 1973, the NHTSA issued a proposal on this subject (38 F.R. 8752). The comments from industry were generally in agreement with the method for testing the orange fluorescent material, although several requested that light source C be allowed for testing of the orange fluorescent material. After consultation with testing laboratories and the National Bureau of Standards, NHTSA has concluded that for purposes of obtaining repeatable results and simulating daylight conditions, source C does not provide the necessary ultraviolet radiation. Therefore, the use of the xenon arc lamp has been incorporated into the standard and will be required for testing of the orange color and luminance of the daylight fluorescent material.

The majority of the commenters and the National Bureau of Standards agreed that the direct illumination method for testing of standard orange fluorescent material for both color and luminance should be continued, and the integrating sphere method should be used for dual-purpose materials. The industry, including the testing laboratories, have had sufficient time to utilize this method and repeatable results have been obtained.

The color definition equation for the orange fluorescent material has been broadened from  $x+y=0.943$  to  $x+y=0.93$ . The majority of

those commenting had no objection to broadening the area of the orange fluorescent material, but one equipment manufacturer desired the red boundary to be extended from  $y=0.35$  to  $y=0.34$ . NHTSA concludes that to do so would place this boundary line too near the red area for proper differentiation between orange and red. Since orange is used as a daylight material, it should not be similar to the red material in color.

As proposed, the three-digit system in the straight-line equations for the boundary of the orange and red colors has been converted to a two-digit system, as this degree of accuracy is sufficient for general testing purposes.

The final amendment to the standard establishes the type of light to be used for testing the orange material used in dual purpose material. Of particular importance in this test procedure is separating the red retroreflective and orange fluorescent material. The majority of the commenters and the National Bureau of Standards recommended that the xenon arc lamp be used, as it provides sufficient ultraviolet radiation to simulate daylight conditions with overcast sky, if the unmodified spectrum illuminating the material is at an angle of incidence of  $45^\circ$  and the angle of observation is  $90^\circ$ . In this procedure, which is adopted, the material is illuminated diffusely by an integrating sphere.

Because a number of amendments to Standard No. 125 have been issued, the standard is hereby reissued in its entirety.

In light of the foregoing, 49 CFR § 571.125, Standard No. 125, Warning Devices, is amended to read as set forth below.



Effective: November 11, 1974

Effective date: Nov. 11, 1974.

Issued on: Aug. 2, 1974.

(Sec. 103, 119, Pub. L. 89-563) 80 Stat. 718,  
15 U.S.C. 1392, 1407; delegation of authority at  
49 CFR 1.51.)

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James B. Gregory  
Administrator  
**39 F.R. 28636**  
**August 9, 1974**

## MOTOR VEHICLE SAFETY STANDARD NO. 125

### Warning Devices

**S1. Scope.** This standard establishes requirements for devices, without self-contained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle.

**S2. Purpose.** The purpose of this standard is to reduce deaths and injuries due to rear end collisions between moving traffic and disabled vehicles.

**S3. Application.** This standard applies to devices without self-contained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle.

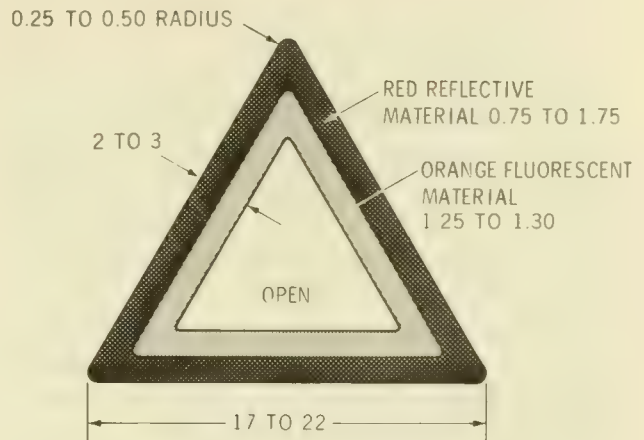
**S.4. Definitions.** "Entrance angle" means the angle having as its sides the line through the center, and normal to the face, of the object to be tested, and the line from the center of the object to the center of the source of illumination (Figure 2).

"Fluorescent" means the property of emitting visible light due to the absorption of radiation of a shorter wave-length which may be outside the visible spectrum.

"Observation angle" means the angle having as its sides the line from the observation point to the center of the object to be tested and the line from the center of that object to the center of the source of illumination (Figure 2).

"Reflex reflective" means reflective of light in directions close to the direction of incident light, over a wide range of variations in the direction of incident light.

### WARNING DEVICE



DIMENSIONS OF WARNING DEVICE (Inches)

Figure 1

### S5. Requirements.

#### S5.1 Equipment.

**S5.1.1** Reflex reflective material and fluorescent material that meet the requirements of this standard shall be affixed to both faces of the warning device. Alternatively, a dual purpose orange fluorescent and red reflective material that meets the requirements of this standard (hereafter referred to as "dual purpose material") may be affixed to both faces in place of the reflective and fluorescent materials.

**S5.1.2** Each warning device shall be protected from damage and deterioration—

(a) By enclosure in an opaque protective reusable container, except that two or three warn-

ing devices intended to be sold for use as a set with a single vehicle may be enclosed in a single container; or

(b) By secure attachment to any light-tight, enclosed and easily accessible compartment of a new motor vehicle with which it is supplied by the vehicle manufacturer.

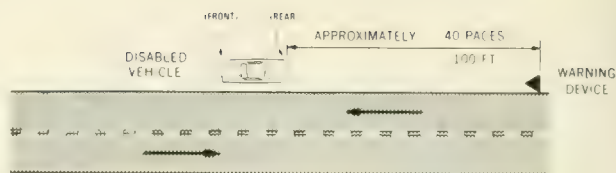
**S5.1.3** The warning device shall be designed to be erected, and replaced in its container, without the use of tools.

**S5.1.4** The warning device shall be permanently and legibly marked with:

- (a) Name of manufacturer;
- (b) Month and year of manufacture, which may be expressed numerically, as "6/72", and
- (c) The symbol DOT, or the statement that the warning device complies with all applicable Federal motor vehicle safety standards.

**S5.1.5** Each warning device shall have instructions for its erection and display.

- a) The instructions shall be either indelibly printed on the warning device or attached in such a manner that they cannot be easily removed.
- (b) Instructions for each warning device shall include a recommendation that the driver activate the vehicular hazard warning signal lamps before leaving the vehicle to erect the warning device.
- (c) Instructions shall include the illustration depicted in Figure 3 indicating recommended positioning.



RECOMMENDED WARNING DEVICE POSITIONING

Figure 3

**S5.2 Configuration**

**S5.2.1** When the warning device is erected on level ground:

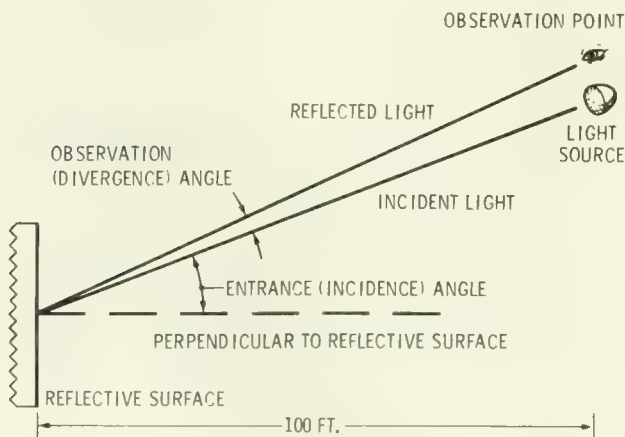
- (a) Part of the warning device shall form an equilateral triangle that stands in a plane not more than 10° from the vertical, with the lower edge of the base of the triangle horizontal and not less than 1 inch above the ground.
- (b) None of the required portion of the reflective material and fluorescent material shall be obscured by any other part of the warning device except for any portion of the material over which it is necessary to provide fasteners, pivoting beads or other means to allow collapsibility or support of the device. In any event, sufficient reflective and fluorescent material shall be used on the triangle to meet the requirements of S5.4 and S5.5.

**S5.2.2** Each of the three sides of the triangular portion of the warning device shall not be less than 17 and not more than 22 inches long, and not less than 2 and not more than 3 inches wide (Figure 1).

**S5.2.3** Each face of the triangular portion of the warning device shall have an outer border of red reflex reflective material of uniform width and not less than 0.75 and not more than 1.75 inches wide, and an inner border of orange fluorescent material of uniform width and not less than 1.25 and not more than 1.30 inches wide (Figure 1). However, this requirement shall not apply if the dual purpose material is used.

**S5.2.4** Each vertex of the triangular portion of the warning device shall have a radius of not less than 0.25 inch and not more than 0.50 inch.

**S5.2.5** All edges shall be rounded or chamfered, as necessary to reduce the possibility of cutting or harm to the user.



REFLECTIVITY TEST DIAGRAM

Figure 2



**S5.2.6** The device shall consist entirely of the triangular portion and attachments necessary for its support and enclosure, without additional visible shapes of attachments.

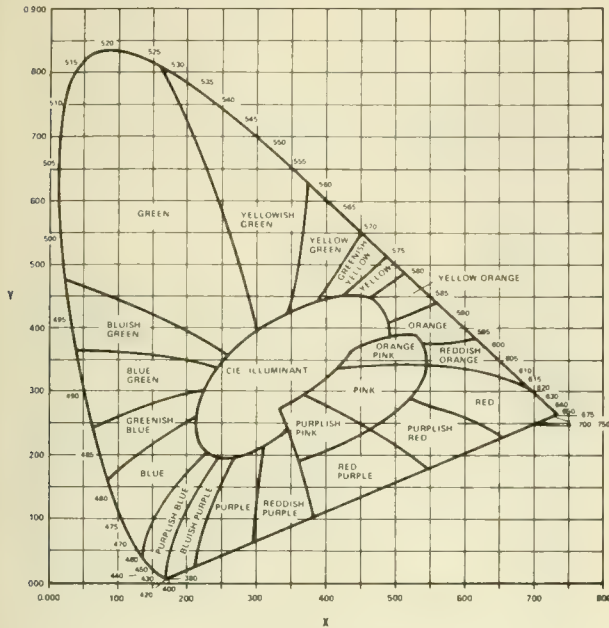


Figure 4 - CIE Chromaticity Diagram

**S5.3 Color.**

**S5.3.1** The color of the red reflex reflective material on the warning device shall have the following characteristics, both before and after the warning device has been conditioned in accordance with S6.1, when the source of illumination is a lamp with a tungsten filament operating at 2856° Kelvin color temperature. Expressed in terms of the International Commission on Illumination (CIE) 1931 standard colorimetric observer system (CIE chromaticity diagram, Figure 4), the chromaticity coordinates of the red reflex reflective material shall lie within the region bounded by the spectrum locus and the lines on the diagram defined by the following equations:

Boundary	Equations
Yellow	$y = 0.33$
White	$x + y = 0.98$

**S5.3.2** The color of the orange fluorescent material on the warning device shall have the following characteristics, both before and after the warning device has been conditioned in accordance with S6.1, when the source of illumina-

tion is a 150-watt high pressure xenon compact arc lamp. Expressed in terms of the International Commission on Illumination (CIE) 1931 standard colorimetric observer system, the chromaticity coordinates of the orange fluorescent material shall lie within the region bounded by the spectrum locus and the lines on the diagram defined by the following equations:

Boundary	Equation
Yellow	$y = 0.49x + 0.17$
White	$x + y = 0.93$
Red	$y = 0.35$

The 150-watt high pressure xenon compact arc lamp shall illuminate the sample using the unmodified spectrum at an angle of incidence of 45° and an angle of observation of 90°. If dual purpose material is being tested, it shall be illuminated by a 150-watt high pressure xenon compact arc lamp, whose light is diffused by an integrating sphere.

**S5.4 Reflectivity.** When the red reflex reflective material on the warning device is tested in accordance with S6.2, both before and after the warning device has been conditioned in accordance with S6.1, its total candlepower per incident foot candle shall be not less than the values specified in Table I for each of the listed entrance angles.

**S5.5 Luminance.** When the orange fluorescent material on the warning device is tested in accordance with S6.3, both before and after the warning device has been conditioned in accordance with S6.1, it shall have a minimum relative luminance of 25 percent of a flat magnesium oxide surface and a minimum product of that relative luminance and width in inches of 44.

**S5.6 Stability.** When the warning device is erected on a horizontal brushed concrete surface both with and against the brush marks and subjected to a horizontal wind of 40 miles per hour in any direction for 3 minutes—

- (a) No part of it shall slide more than 3 inches from its initial position;
- (b) Its triangular potion shall not tilt to a position that is more than 10° from the vertical; and
- (c) Its triangular position shall not turn through a horizontal angle of more than 10° in either direction from the initial position.

TABLE 1. Total Minimum Candlepower Per Incident Foot Candle

Entrance Angles - Degrees

Observation Angles-Degrees	0	10 up	10 down	20 left	20 right	30 left	30 right
0.2	80	80	80	40	40	8.0	8.0
1.5	0.8	0.8	0.8	0.4	0.4	0.08	0.08

**S5.7 Durability.** When the warning device is conditioned in accordance with S6.1; no part of the warning device shall become warped or separated from the rest of the warning device.

#### S6. Test Procedures.

##### S6.1 Conditions.

**S6.1.1** Submit the warning device to the following conditioning sequence, returning the device after each step in the sequence to ambient air at 68° F. for at least 2 hours.

(a) Minus 40° F. for 16 hours in a circulating air chamber using ambient air which would have not less than 30 percent and not more than 70 percent relative humidity at 70° F.;

(b) 150° F. for 16 hours in a circulating air oven using ambient air which would have not less than 30 percent and not more than 70 percent relative humidity at 70° F.;

(c) 100° F. and 90 percent relative humidity for 16 hours;

(d) Salt spray (fog) test in accordance with American Society of Testing and Materials Standard B-117, Standard Method of Salt Spray (fog) testing, August 1964, except that the test shall be for 4 hours rather than 40 hours; and

(e) Immersion for 2 hours in water at a temperature of 100° F.

**S6.2 Reflectivity Test.** Test the red reflex reflective material as follows:

(a) Unless dual purpose material is used, prevent the orange fluorescent material from affecting the photometric measurement of the reflectivity of the red reflex reflective material, either by separation or masking.

(b) Use a lamp with a tungsten filament operating at 2856° Kelvin color temperature as the source of illumination.

(c) Place the source of illumination 100 feet from the red reflex reflective material (Figure 2).

(d) Place the observation point directly above the source of illumination (Figure 2).

(e) Calculate the total candlepower per incident foot candle of the red reflex reflective material at each of the entrance and observation angles specified in Table 1.

**S6.3 Luminance Test.** Test the orange fluorescent material as follows:

(a) Unless dual purpose material is used, prevent the red reflex reflective material from affecting the photometric measurement of the luminance of the orange fluorescent material.

(b) Using a 150-watt high pressure xenon compact arc lamp as the light source, illuminate the test sample at an angle of incidence of 45° and an angle of observation of 90°. If dual purpose material is being tested, illuminate the sample diffusely through an integrating sphere.

(c) Measure the luminance of the material at a perpendicular viewing angle, with no ray of the viewing beam more than 5° from the perpendicular to the specimen.

(d) Repeat the procedure for a flat magnesium oxide surface, and compute the quotient (percentage) of the luminance of the material relative to that of the magnesium oxide surface.

37 F.R. 5038  
March 9, 1972



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 126

### Truck-Camper Loading

(Docket No. 71-7; Notice 2)

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 126 (49 CFR 571.126) that requires manufacturers of slide-in campers and of trucks that would accommodate them to provide information concerning proper loading and load distribution. A notice of proposed rulemaking on this subject was published on April 9, 1971 (36 F.R. 6837).

The purpose of the new standard is to provide information that can be used to reduce overloading and improper load distribution in truck-camper combinations, and to prevent accidents resulting from the adverse effects of these conditions on vehicle handling and braking. Standard No. 126 requires manufacturers of slide-in campers to permanently affix a label to a rear surface of each camper that includes the weight of the camper when it contains standard equipment, and water, bottled gas, and ice box with ice or refrigerator. The camper manufacturer is also required to provide, in an owner's manual or other document delivered with the camper, a picture showing the location of the longitudinal center of gravity of the camper when loaded and a picture showing a proper match of the slide-in camper on a typical truck. Standard No. 126 also requires manufacturers of trucks to which a camper could be attached to provide, in an operator's manual or other document delivered with the truck, a picture showing the manufacturer's recommended longitudinal center of gravity zone for the cargo weight rating, and one depicting the proper match of a truck and slide-in camper.

Standard No. 126 differs from the proposal in several aspects. The standard as proposed would have applied to incomplete vehicles intended for completion as trucks, and to multipurpose passenger vehicles with a GVWR of 10,000 pounds

or less. These categories have been excluded from the final rule, which applies to trucks that would accommodate slide-in campers. These generally are pick-up trucks. In excluding other proposed categories the NHTSA considers that the information the manufacturer of an incomplete vehicle must furnish pursuant to 49 CFR Part 568, *Vehicles Manufactured in Two or More Stages*, should be sufficient to assist a final assembler in permanently installing a chassis-mount camper on a truck chassis, or in assembling a vehicle such as a motor home.

The proposal would also have required that a label be permanently affixed to each cargo compartment that would specify the maximum recommended weight for a load placed in the compartment. Commenters argued persuasively that camper owners would disregard a series of weight capacity labels on all storage compartments, and the proposal was not adopted. The final rule requires the certification label and the owner's manual to provide a figure denoting camper weight, which as noted previously includes the weight of standard equipment, a refrigerator, or ice box with ice, and maximum capacity of water and bottled gas. The cubic capacity of the refrigerator or weight of ice, the weight of bottled gas, and the gallons of water encompassed in the maximum weight figure will also be listed on the permanent label and in the owner's manual. The camper manufacturer may exclude any of these items from the label if the camper is not designed to accommodate them, provided that a notation to that effect appears in the owner's manual. The standard also requires a manufacturer to provide a listing of optional or additional equipment that the camper is designed to carry, and the respective weight of each if the unit weight exceeds 20 pounds.



The label will also state the month and year of manufacture, and a recommendation that the user consult the owner's manual or data sheet for the weight of optional and additional equipment. The label is to be mounted in a plainly visible location on a surface at the rear of the camper other than the roof, steps or bumper extension.

The proposed reference point, or the distances of the camper center of gravity from the reference point, have not been adopted for use on the exterior label. Manufacturers of campers generally have had no experience with the relatively complex vertical center of gravity measurement techniques. Truck manufacturers pointed out a number of variables that would have to be considered, and stated that the limiting envelope would not be rectangular as implied by the proposal. Other comments objected to the end of the truck's axle shaft as a reference point for specifying a recommended cargo center of gravity zone. Variations in the longitudinal center of gravity of the load are, however, known to have a direct relationship to a truck's gross axle loading, and can adversely affect the steering and stopping ability of the vehicle. The camper manufacturer will therefore be required to provide in the owner's manual a picture showing the location of the camper's longitudinal center of gravity within 2 inches, under specified load conditions. A manufacturer can easily measure the longitudinal center of gravity of a slide-in camper by balancing it on a transverse horizontal rod. The camper owner's manual must also contain specific advice on proper choice of truck to which a camper may be mounted, and proper loading of the camper once it is attached. Truck

manufacturers in turn are required to include in the operator's manual a picture showing the recommended longitudinal center of gravity zone for the cargo weight rating and loading recommendations.

In order to allow the relatively small camper manufacturers time to consider the recommendations of truck manufacturers, and to modify camper designs if needed, a camper manufacturer need not provide center of gravity location information until July 1, 1973.

*Effective date:* January 1, 1973, with additional requirements effective July 1, 1973. Because compliance with the rule does not involve extensive leadtime, the Administrator finds for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

In consideration of the foregoing, 49 CFR Part 571 is amended by adding § 571.126, Standard No. 126, *Truck-Camper Loading*. . . .

This notice is issued under the authority of Sections 103, 112, 114, and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1403, and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on August 3, 1972.

Douglas W. Toms  
Administrator

37 F.R. 16497  
August 15, 1972

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

### Truck-Camper Loading

(Docket No. 71-7; Notice 4)

This notice responds to petitions for reconsideration of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Truck-Camper Loading*. The portion of the regulation requiring information to be provided by camper manufacturers is retained as a Federal motor vehicle safety standard, and a vehicle information number is added to the list of information to be provided. The portion of the rule applicable to truck manufacturers is reissued as a consumer information regulation by a separate notice (37 F.R. 26607).

Standard No. 126, establishing requirements for slide-in campers and trucks that would accommodate them, was published on August 15, 1972 (37 F.R. 16497). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the standard were filed by Chrysler Corporation (Chrysler), Ford Motor Company (Ford), General Motors Corporation (GM), Jeep Corporation (Jeep), Motor Vehicle Manufacturers Association of the United States, Inc. (MVMA), Recreational Vehicle Institute, Inc. (RVI), and Toyota Motor Sales, U.S.A., Inc. (Toyota).

In response to information contained in several of these petitions the standard is being amended in certain respects. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Statutory Authority.* Standard No. 126 as issued applied to slide-in campers and to trucks that would accommodate them. It required manufacturers of slide-in campers to attach to their products a label containing the name of the manufacturer, the month and year of manufacture, a certification of conformity, and information concerning the camper's maximum weight. The standard also required camper manufacturers to

provide the same information and certain additional items in a manual or other document to accompany each camper. A parallel requirement was adopted applicable to truck manufacturers; they were required to provide information in a manual or other document supplied with their products that would assist truck owners in choosing a properly matched camper.

Chrysler, Ford, GM, Jeep, and MVMA questioned the authority to issue the requirements of 49 CFR § 571.126 as a Federal motor vehicle safety standard rather than in the form of a Consumer Information Regulation (49 CFR Part 575), alleging that Standard No. 126 is "neither a performance standard nor does it provide any objective criteria for determining compliance."

The NHTSA does not agree that it lacks authority to issue Standard No. 126 in the form in which it appeared. Actually, the regulation was issued under the combined authority of four sections of the Act: section 103 (the authority for the Federal motor vehicle safety standards), section 112 (the primary authority for technical information and data to be provided by a manufacturer to NHTSA and the consumer), section 114 (the authority for vehicle and equipment certification) and section 119 (the general rule-making authority). Many of the existing standards contain information requirements, and it is the position of this agency that such provisions fully satisfy the statutory criteria as objective performance requirements. The question therefore is in most respects the merely formal one of whether the rule is called a "safety standard" or a "consumer information regulation," and codified accordingly.



On reconsideration of all aspects of the standard, however, this agency has determined that there is an advantage to issuing the requirements for trucks in the form of a consumer information regulation. 49 CFR § 575.6(b) requires all Part 575 consumer information to be made available to prospective purchasers in dealer showrooms, and paragraph (c) of that section requires such information to be furnished directly to the NHTSA. Neither of these requirements applies to information furnished pursuant to Part 571 safety standards. Part 575 consumer information regulations are enforceable in substantially the same manner and with the same sanctions as safety standards. The requirements for trucks in 49 CFR § 571.126 are therefore reissued as a new consumer information regulation, 49 CFR § 575.103, by an action published in this issue, 37 F.R. 26607.

2. *Effective date.* The requirement for pictures showing camper center of gravity and proper truck-camper match that camper manufacturers were to provide as of July 1, 1973, is being deferred 2 months, and will not be required until September 1, 1973. RVI has petitioned for an extension of the effective date of these requirements to January 1, 1974, on the basis that the extension "would give the relatively small camper manufacturers additional time to conform camper design to the center of gravity envelopes developed by the truck manufacturers." The regulation, however, only requires manufacturers to provide information, not to redesign their products. The NHTSA finds that RVI has shown insufficient justification to support its request, and the petition is denied.

3. *Definitions.* RVI petitioned that its definition of "camper" be adopted so that there would be no confusion within the recreational vehicle industry as to whether the standard applied to motor homes and pickup covers. RVI's petition was similar to the one it submitted for reconsideration of Standard No. 205, *Glazing Materials*. The NHTSA has not adopted the RVI definition, but it has defined the terms "camper" and "slide-in camper" so as to clarify these terms and differentiate them from "motor home" and "pickup cover," also defined in Standard No. 205. "Cargo weight rating" was defined as "the maximum weight of cargo . . . that can safely be

carried by a vehicle under normal operating conditions. . . ." Ford objects that the definition is subjective and urges that the term be redefined as "the maximum weight of cargo . . . that the truck manufacturer specifies may be carried on the vehicle." The NHTSA concurs generally with Ford's views. The definition has been rewritten to make clear that the rating, like GVWR and GAWR, is to be assigned at the discretion of the manufacturer.

4. *Information.* Ford believes the reference to "total load" in paragraph S5.1.2(c) is misleading "in that users may easily understand this to be the total load on the truck." It suggests substitution of the term "cargo load." Ford's point is well made, and the term is redesignated "total cargo load" as a clarification.

Toyota has asked that paragraph S5.1.2(e) be amended to substitute four inches for the requirement that camper manufacturers provide a picture showing the location of the center of gravity of the camper within an accuracy of two inches under the loaded condition. The petition is denied. The intent of the specification is to insure an accuracy within two inches, in either direction, in effect, a range of four inches. The NHTSA does not consider this tolerance to be overly demanding.

Finally, RVI states that its members have had difficulty in interpreting Figure 2 and requests the NHTSA to more clearly indicate "that the terminology 'Mount at Aft End of Truck Cargo Area' means that the designated point in the figure signifies the point where the identified surface of the camper abuts the rearmost edge or surface of the cargo area of the truck, presumably the tailgate in most configurations." To clarify its intent the NHTSA is changing the language in question to "point that contacts rear end of truck bed."

5. *Vehicle Identification Number (VIN.)* The NHTSA proposed on August 15, 1972 (Docket No. 71-7; Notice 3, F.R. 16505) that slide-in campers be identified by a VIN, consisting of arabic numerals, roman letters, or both. The notice also proposed to require that the VIN of two campers manufactured by a manufacturer within a ten year period shall not be identical. No objections were raised to the proposal, and Standard No. 126 is amended to adopt the pro-



posed requirements, reworded slightly effective January 1, 1973.

In consideration of the foregoing, 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, is amended. . . .

*Effective date:* January 1, 1973, with additional requirements effective September 1, 1973. Because the amendment consists principally of the reissue of existing requirements, and compliance with the amendment requiring a VIN does not involve extensive leadtime, the Administrator finds for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

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This notice is issued under the authority of sections 103, 112, 114, and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1403, and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on: December 6, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 26605**  
**December 14, 1972**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

## Truck-Camper Loading

(Docket No. 71-7; Notice 7)

This notice responds to a petition for reconsideration of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Truck-camper loading*, with an amendment allowing optional wording of a portion of the placard to be affixed to campers, and of other required information. The amendments are effective upon publication in the *Federal Register*.

On August 15, 1972 Motor Vehicle Safety Standard No. 126 was originally published (37 F.R. 16497). In response to petitions for reconsideration the standard was republished on December 14, 1972 (37 F.R. 26605) with amendments that included minor changes in the text of information required to be furnished to purchasers of slide-in campers.

Paragraph S5.1.2(a) of Standard No. 126 requires each manufacturer of a slide-in camper to provide in a manual or other document delivered with each camper "the statement and information provided on the certification label as specified in paragraph S5.1.1". Among this information is the month and year that the camper was manufactured. The Trailer Coach Association has asked in a letter dated December 29, 1972 that wording such as "see certification label for date of manufacture" be substituted for the month and year of manufacture, contending that "to require manufacturers to list the month and year of manufacture in each vehicle owner's manual would be an unnecessary hardship in view of the production and shipping schedule which varies greatly from time to time during the year."

The NHTSA believes that the request of TCA is reasonable, and is treating TCA's letter as a petition for reconsideration filed pursuant to 49 CFR 553.35. However, since the information

requirement became effective January 1, 1973, and because of the possibility that manufacturers now providing this data may wish to continue to do so, the manufacturer should have the option of including either the month and year of manufacture or a reference to the certification label. The standard is being amended to provide this option.

In the amendments published on December 14, 1972 two minor changes were made in terminology. In Paragraph S5.1.2(c) the phrase "total load", which appears twice, was changed to "total cargo load" as a clarification. Further clarification was provided in an amendment to Figure 2, Camper Center of Gravity Information where the legend "Mount at Aft End of Truck Cargo Area" was changed to "Point That Contacts Rear End of Truck Bed". In view of the amendments to § 575.103 delaying the effective date 30 days until April 1, 1973, and permitting use of the earlier form until October 1, 1973 (Docket No. 71-7; Notice 6 (38 F.R. 4400)), camper manufacturers who have printed manuals with the old terminology should be afforded the same opportunity as truck manufacturers to exhaust obsolete stocks of materials. Appropriate amendments are therefore made to Standard No. 126, including a 30 day delay in the pictorial information that was to have been provided as of September 1, 1973.

In consideration of the foregoing 49 CFR § 571.126 Motor Vehicle Safety Standard No. 126 is amended . . . .

*Effective date:* February 14, 1973. Because the amendments create no additional burden it is found for good cause that an effective date earlier than one hundred eighty days after issuance is in the public interest.



**Effective: February 14, 1973**

(Sec. 103, 112, 114, and 119, Pub. L. 89-563,  
80 Stat. 718, 15 U.S.C. 1392, 1401, 1403 and 1407;  
delegation of authority at 49 CFR 1.51.)

Issued on February 12, 1973.

Douglas W. Toms  
Administrator

**38 F.R. 4399**  
**February 14, 1973**

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## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

### Truck-Camper Loading

(Docket No. 71-7; Notice 8)

This notice corrects the amendment to 49 CFR § 571.126, Standard No. 126, *Truck-camper loading*, published on February 14, 1973 (38 F.R. 4399). The amendment to paragraph S5.1.2(a) erroneously referred to "the information required by subparagraphs (c) and (d) of paragraph S5.1.1". The reference should have been to "subparagraphs (b) and (c)".

Additionally, the opening statement of the preamble erroneously stated that the amendment allowed "optional wording of a portion of the placard to be affixed to campers, and of other required information". The amendment itself correctly allowed optional wording of informa-

tion provided in the manual or other document delivered with the camper, not on the placard.

*Effective date:* March 9, 1973. Because the amendment corrects an error, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 112, 114 and 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1403, and 1407; delegation of authority at 49 CFR 1.51.)

Issued on March 5, 1973.

Douglas W. Toms  
Administrator

**38 F.R. 6392**  
**March 9, 1973**





# PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 126

## Truck-Camper Loading

(Docket No. 71-7; Notice 10)

This notice amends Standard No. 126, *Truck-Camper Loading*, by removing the requirement that a camper's vehicle identification number (VIN) be printed in its owner's manual. Such a modification will reduce the cost of compliance with the standard, without adversely affecting the level of safety prescribed.

Effective Date: April 27, 1978.

### For Further Information Contact:

Kevin Cavey, Crash Avoidance Division,  
Office of Vehicle Safety Standards, National  
Highway Traffic Safety Administration, 400  
Seventh Street, S.W., Washington, D.C.  
20590 (202-426-2716).

Supplementary Information: On November 29, 1973, the NHTSA issued a notice proposing to amend Standard No. 126, *Truck-Camper Loading*, to remove the requirement that the vehicle identification number (VIN) of each camper be printed in its owner's manual (38 FR 32945). The amendment, requested by the Recreation Vehicle Industry Association, was proposed to reduce the burdens and costs associated with compliance with the requirement.

Comments were received from Ford, the Recreation Vehicle Industry Association, and the Recreational Vehicle Division of the Trailer Coach Association. The Vehicle Equipment Safety Commission did not submit comments.

The three comments received supported the suggested modification. Some commenters asserted that the requirement added little to vehicle safety while resulting in increased costs and the

increased possibility of errors associated with inserting the incorrect VIN in an owner's manual. The NHTSA concurs with the commenters and concludes that the intent of the requirement can be achieved by permitting a manufacturer to state in the owner's manual that the VIN can be found by referring to the camper's certification label. Accordingly, Standard No. 126 is amended to make optional the provision of the VIN in a camper's owner's manual. If the VIN is not placed in the owner's manual, a reference must be made in the manual to the location of the VIN on the certification label.

In consideration of the foregoing, the second sentence of paragraph S5.1.2 of Standard No. 126, 49 CFR Part 571.126 is amended. . . .

Since this amendment relieves a restriction and imposes additional burden on any person, it is found for good cause shown that an immediate effective date is in the public interest.

The principal authors of this notice are Kevin Cavey of the Office of Vehicle Safety Standards and Roger Tilton of the Office of Chief Counsel.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on April 21, 1978.

Joan Claybrook  
Administrator

**43 F.R. 17946**  
**April 27, 1978**



## MOTOR VEHICLE SAFETY STANDARD NO. 126

### Truck-Camper Loading

(Docket No. 71-7; Notice 2)

**S1. Scope.** This standard requires manufacturers of slide-in campers to affix a label to each camper that contains information relating to certification, identification, and proper loading, and to provide more detailed loading information in the owner's manual.

**S2. Purpose.** The purpose of this standard is to provide information that can be used to reduce overloading and improper load placement in truck-camper combinations, and unsafe truck-camper matching, in order to prevent accidents resulting from the adverse effects of these conditions on vehicle steering and braking.

**S3. Application.** This standard applies to slide-in campers.

#### S4. Definitions.

"Camper" means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

"Cargo weight rating" means the value specified by the manufacturer as the cargo-carrying capacity, in pounds, of a vehicle, exclusive of the weight of occupants in designated seating positions.

"Slide-in camper" means a camper having a roof, floor and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

#### S5. Requirements.

##### S5.1 Slide-in camper.

**S5.1.1 Labels.** Each slide-in camper shall have permanently affixed to it, in a manner that it

cannot be removed without defacing or destroying it, in a plainly visible location on an exterior rear surface other than the roof, steps, or bumper extension, a label containing the following information in the English language lettered in block capitals and numerals not less than  $\frac{3}{32}$ -inch high, of a color contrasting with the background, in the order shown below and in the form illustrated in Figure 1.

MFG. BY: (CAMPER MANUFACTURER'S NAME)
(MONTH AND YEAR OF MANUFACTURE)
THIS CAMPER CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
CAMPER WEIGHT IS _____ LBS. MAXIMUM WHEN IT CONTAINS STANDARD EQUIPMENT, _____
GAL. OF WATER, _____ LBS. OF BOTTLED GAS, AND _____ CUBIC FT. REFRIGERATOR (or ICE BOX WITH _____ LBS. OF ICE, as applicable).
CONSULT OWNER'S MANUAL (or DATA SHEET as applicable) FOR WEIGHTS OF ADDITIONAL OR OPTIONAL EQUIPMENT.
(VEHICLE IDENTIFICATION NUMBER)

FIGURE 1. Label for Campers

(a) Name of camper manufacturer. The full corporate or individual name of the actual assembler of the camper shall be spelled out, except that such abbreviations as "Co.," or "Inc.," and their foreign equivalents, and the first and middle initials of individuals may be used. The name of the manufacturer shall be preceded by the words "Manufactured By" or "Mfd. By".

(b) Month and year of manufacture. It may be spelled out (*e.g.*, "June 1973"), or expressed in numerals (*e.g.*, "6/73").

(c) The statement: "This camper conforms to all applicable Federal Motor Vehicle Safety



Standards in effect on the date of manufacture shown above." The expression "U.S." or "U.S.A." may be inserted before the word "Federal."

(d) The following statement completed as appropriate: "CAMPER WEIGHT IS \_\_\_\_\_ LBS. MAXIMUM WHEN IT CONTAINS STANDARD EQUIPMENT, \_\_\_\_\_ GAL. OF WATER, \_\_\_\_\_ LBS. OF BOTTLED GAS, AND \_\_\_\_\_ CUBIC FT. REFRIGERATOR (or ICE BOX WITH \_\_\_\_\_ LBS. OF ICE, as applicable). CONSULT OWNER'S MANUAL (or DATA SHEET as applicable) FOR WEIGHTS OF ADDITIONAL OR OPTIONAL EQUIPMENT."

"Gal. of water" refers to the volume of water necessary to fill the camper's fresh water tanks to capacity. "Lbs. of bottled gas" refers to the weight of gas necessary to fill the camper's bottled gas tanks to capacity. The statement regarding a "Refrigerator" or "Icebox" refers to the capacity of the refrigerator with which the vehicle is equipped or the weight of the ice with which the icebox may be filled. Any of these items may be omitted from the statement, if the corresponding accessories are not included with the camper, provided that the omission is noted in the camper owner's manual as required in paragraph S5.1.2(a).

(e) Vehicle Identification Number. Each slide-in camper shall have a number assigned by its manufacturer for identification purposes consisting of arabic numerals, roman letters, or both. No two slide-in campers manufactured by the same manufacturer within any 10-year period shall have the same Vehicle Identification Number.

**S5.1.2 Owner's manual.** Each slide-in camper manufacturer shall provide with each camper a manual or other document containing the information specified in S5.1.2(a) through S5.1.2(d). The information in S5.1.2(e) and S5.1.2(f) shall also be provided with each camper manufactured on or after October 1, 1973.

(a) The statement and information provided on the certification label as specified in paragraph S5.1.1. Instead of the information required by subparagraphs (b), (c), and (e) of paragraph S5.1.1, a manufacturer may use the statements, "See camper certification label (located on camper's rear exterior surface) for month and year of manufacture and for the Vehicle Identification Number" and "This camper conforms to all applicable Federal Motor Vehicle Safety Standards in effect on the date of manufacture."

(b) A list of other additional or optional equipment that the camper is designed to carry, and the maximum weight of each if its weight is more than 20 lbs. when installed.

(c) The statement: "To estimate the total cargo load that will be placed on a truck, add the weight of all passengers in the camper, the weight of supplies, tools, and all other cargo, the weight of installed additional or optional camper equipment, and the manufacturer's camper weight figure. Select a truck that has a cargo weight rating that is equal to or greater than the total cargo load of the camper, and whose manufacturer recommends a cargo center of gravity zone that will contain the camper's center of gravity when it is installed." Until October 1, 1973, the phrase "total load" may be used instead of "total cargo load."

(d) The statements: "When loading this camper store heavy gear first, keeping it on or close to the camper floor. Place heavy things far enough forward to keep the loaded camper's center of gravity within the zone recommended by the truck manufacturer. Store only light objects on high shelves. Distribute weight to obtain even side-to-side balance of the loaded vehicle. Secure loose items to prevent weight shifts that could affect the balance of your vehicle. When the truck-camper is loaded, drive to a scale and weigh on the front and on the rear wheels separately to determine axle loads. The load on an axle should not exceed its gross axle weight rating (GAWR). The total of the axle loads should not exceed the gross vehicle weight rating (GVWR). These weight ratings are given on the vehicle certification label that is located on the left side of the vehicle, normally the dash panel, hinge pillar, door latch post, or door edge next to the driver on trucks manu-

factured on or after January 1, 1972. If weight ratings are exceeded, move or remove items to bring all weights below the ratings."

(e) A picture showing the location of the longitudinal center of gravity of the camper within an accuracy of 2 inches under the loaded condition specified in paragraph S5.1.1(d), in the manner illustrated in Figure 2. Until October 1, 1973 the phrase "Mount at Aft End of Truck Cargo Area" may be used in Figure 2 instead of "Point That Contacts Rear End of Truck Bed".

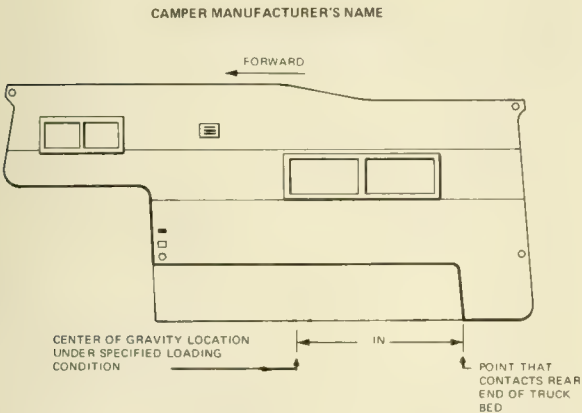


FIGURE 2 - CAMPER CENTER OF GRAVITY INFORMATION

(f) A picture showing the proper match of a truck and slide-in camper in the form illustrated in Figure 3.

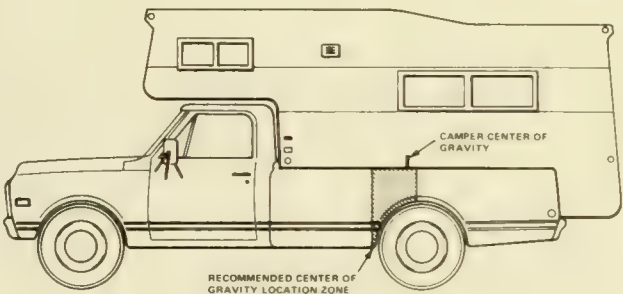


FIGURE 3 EXAMPLE OF PROPER TRUCK AND CAMPER MATCH

37 F.R. 16497  
August 15, 1972





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO.201****Occupant Protection In Interior Impact—Passenger Cars****(Docket No. 19)**

Motor Vehicle Safety Standard No. 201, issued January 31, 1967, and published in the *Federal Register*, February 3, 1967 (32 F.R. 2413), specifies requirements for instrument panels, seat backs, protrusions, sun visors, and armrests to afford impact protection for occupants of passenger cars manufactured after January 1, 1968.

Parties adversely affected by the Standard were permitted to petition for reconsideration on or before March 6, 1967, pursuant to 23 CFR 215.17. By order dated March 29, 1967, the Acting Under Secretary of Commerce for Transportation consolidated the 27 petitions related to Standard No. 201 and ordered that a hearing on reconsiderations be held.

On April 21, 1967, the Federal Highway Administration issued an order directing that a rule-making hearing be held pursuant to 5 U.S.C. 553 (formerly sec. 4 of the Administrative Procedure Act (60 Stat. 238, 5 U.S.C. 1003)). The hearing was held May 22 and 23, 1967, at Detroit, Mich., and May 24 and 25, 1967, at Washington, D.C. On June 22, 1967, the presiding officer submitted his Report of Recommended Findings to the Federal Highway Administration.

On June 8 and 9, 1967, and July 6 and 7, 1967, meetings were held by the National Highway Safety Bureau with domestic and foreign auto industry engineers in which detailed engineering discussions of all problems of compliance with the Standard were held.

After review of the evidence presented at the hearings ordered by the Federal Highway Administration, the report of the presiding officer,

and the Bureau's analysis of the engineering meetings with the industry, I have determined that Standard 201 issued January 31, 1967, should be superseded by a new Standard that specifies initial requirements to afford impact protection for occupants, and that certain related definitions should be amended accordingly.

Good cause is shown that an effective date earlier than 180 days after issuance is in the public interest and notice and public procedure hereon are unnecessary since these amendments relieve restrictions and impose no additional burden on any person.

In consideration of the foregoing, Part 371, Initial Federal Motor Vehicle Safety Standards, is amended by superseding § 371.21, Motor Vehicle Safety Standard No. 201 (32 F.R. 2413), with a new Motor Vehicle Safety Standard No. 201 . . . and by amending § 371.3(b) . . .

These amendments are made under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority of March 31, 1967 (32 F.R. 5606), as amended April 6, 1967 (32 F.R. 6495), and becomes effective January 1, 1968.

Issued in Washington, D.C., on August 11, 1967.

Lowell K. Bridwell,  
Federal Highway Administrator

**32 F.R. 11776**  
**August 16, 1967**



# PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 201

## Occupant Protection in Interior Impact (Docket No. 78-116; Notice 2)

**ACTION:** Final rule.

**SUMMARY:** This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

**EFFECTIVE DATE:** The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

**ADDRESS:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

**SUPPLEMENTARY INFORMATION:** This notice amends Standard No. 201, *Occupant Protection in Interior Impact*, and Standard No. 203, *Impact Protection for the Driver From the Steering Control System*, to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement*, to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting*, and Standard No. 219-75, *Windshield Zone Intrusion*, led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards



Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

### Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars. Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience

less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed rulemaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201, 203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manufacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

### Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done by Sherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly demonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data

indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the



requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA believes that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The

probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

#### *Loading Requirements*

At present, Standard No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

#### *Commercial Vehicles*

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting*, and Standard 219-75, *Windshield Zone Intrusion*. As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.



The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

#### *Walk-In Vans*

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more

slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention*, and 219-75, *Windshields Zone Intrusion*. The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their unique driver/steering column configuration, and thus is exempting walk-in vans for the present.

#### *Belts in Forward Control Vehicles*

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection*. They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

#### *Upgrading of Standard*

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

#### *Heavy Trucks*

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe

injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

#### *Miscellaneous Comments*

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a head-form representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exceptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.



### *Costs and Leadtime*

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been placed in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said

that the cost associated with complying with all three standards was \$30. Ford estimated the cost for compliance with Standard No. 201 as \$10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at \$120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance. Based on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of \$16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a \$27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between \$6 and \$15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design assumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with



the standard, the DeLorean Corp. also examined the leadtime necessary to comply with the standards. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18-24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of lead-

time for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 20, 1979.

Joan Claybrook  
Administrator

**44 F.R. 68470**  
**November 29, 1979**

## **MOTOR VEHICLE SAFETY STANDARD NO. 201**

### **Occupant Protection in Interior Impact—Passenger Cars**

**S1. Purpose and scope.** This standard specifies requirements to afford impact protection for occupants.

**S2. Application.** This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less.

**S3. Requirements for passenger cars and for trucks, buses and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1981.**

**S3.1 Instrument panels.** Except as provided in S3.1.1, when that area of the instrument panel that is within the head impact area is impacted in accordance with S3.1.2 by a 15 pound, 6.5 inch diameter head form at a relative velocity of 15 miles per hour, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

**S3.1.1** The requirements of S3.1 do not apply to—

- (a) Console assemblies;
- (b) Areas less than 5 inches inboard from the juncture of the instrument panel attachment to the body side inner structure;
- (c) Areas closer to the windshield juncture than those statically contactable by the head form with the windshield in place;
- (d) Areas outboard of any point of tangency on the instrument panel of a 6.5 inch diameter head form tangent to and inboard of a vertical longitudinal plane tangent to the inboard edge of the steering wheel; or
- (e) Areas below any point at which a vertical line is tangent to the rearmost surface of the panel.

**S3.1.2 Demonstration procedures.** Tests shall be performed as described in Society of Automotive Engineers Recommended Practice J921, "Instrument Panel Laboratory Impact Test Procedure," June 1965, using the specified instrumentation or instrumentation that meets the

performance requirements specified in Society of Automotive Engineers Recommended Practice J977, "Instrumentation for Laboratory Impact Tests," November 1966, except that—

(a) The origin of the line tangent to the instrument panel surface shall be a point on a transverse horizontal line through a point 5 inches horizontally forward of the seating reference point of the front outboard passenger designated seating position, displaced vertically an amount equal to the rise which results from a 5 inch forward adjustment of the seat or 0.75 inches; and

(b) Direction of impact shall be either—

- (1) In a vertical plane parallel to the vehicle longitudinal axis; or
- (2) In a plane normal to the surface at the point of contact.

**S3.2 Seat Backs.** Except as provided in S3.2.1, when that area of the seat back that is within the head impact area is impacted in accordance with S3.2.2 by a 15 pound, 6.5 inch diameter head form at a relative velocity of 15 miles per hour, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

**S3.2.1** The requirements of S3.2 do not apply to rearmost, side-facing, back-to-back, folding auxiliary jump, and temporary seats.

**S3.2.2 Demonstration procedures.** Tests shall be performed as described in Society of Automotive Engineers Recommended Practice J921, "Instrument Panel Laboratory Impact Test Procedure," June 1965, using the specified instrumentation or instrumentation that meets the performance requirements specified in Society of Automotive Engineers Recommended Practice J977, "Instrumentation for Laboratory Impact Tests," November 1966, except that—

(a) The origin of the line tangent to the uppermost seat back frame component shall be a point

on a transverse horizontal line through the seating reference point of the right rear designated seating position, with adjustable forward seats in their rearmost design driving position and reclinable forward seat backs in their nominal design driving position;

(b) The direction of impact shall be either—

(1) In a vertical plane parallel to the vehicle longitudinal axis; or

(2) In a plane normal to the surface at the point of contact;

(c) For seats without head restraints installed, tests shall be performed for each individual split or bucket seats back at points within 4.0 inches left and right of its centerline, and for each bench seat back between points 4.0 inches outboard of the centerline of each outboard designated seating position;

(d) For seats having head restraints installed, each test shall be conducted with the head restraint in place at its lowest adjusted position, at a point on the head restraint centerline; and

(e) For a seat that is installed in more than one body style, tests conducted at the fore and aft extremes identified by application of subparagraph (a) shall be deemed to have demonstrated all intermediate conditions.

**S3.3 Interior compartment doors.** Each interior compartment door assembly located in an instrument panel, console assembly, seat back, or side panel adjacent to a designated seating position shall remain closed when tested in accordance with either S3.31(a) and S3.3.1(b) or S3.3.1(a) and S3.3.1(c). Additionally, any interior compartment door located in an instrument panel or seat back shall remain closed when the instrument panel or seat back is tested in accordance with S3.1 and S3.2. All interior compartment door assemblies with a locking device must be tested with the locking device in an unlocked position.

**S3.3.1 Demonstration procedures.**

(a) Subject the interior compartment door latch system to an inertia load of 10g in a horizontal transverse direction and an inertia load of 10g in a vertical direction in accordance with the procedure described in section 5 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965, or an approved equivalent.

(b) Impact the vehicle perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

(c) Subject the interior compartment door latch system to a horizontal inertia load of 30g in a longitudinal direction in accordance with the procedure described in section 5 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965 or an approved equivalent.

**S3.4 Sun visors.**

**S3.4.1** A sun visor that is constructed of or covered with energy-absorbing material shall be provided for each front outboard designated seating position.

**S3.4.2** Each sun visor mounting shall present no rigid material edge radius of less than 0.125 inch that is statically contactable by a spherical 6.5 inch diameter head form.

**S3.5 Armrests.**

**S3.5.1 General.** Each installed armrest shall conform to at least one of the following:

(a) It shall be constructed with energyabsorbing material and shall deflect or collapse laterally at least 2 inches without permitting contact with any underlying rigid material.

(b) It shall be constructed with energy-absorbing material that deflects or collapses to within 1.25 inches of a rigid test panel surface without permitting contact with any rigid material. Any rigid material between 0.5 and 1.25 inches from the panel surface shall have a minimum vertical height of not less than 1 inch.

(c) Along not less than 2 continuous inches of its length, the armrest shall, when measured vertically in side elevation, provide at least 2 inches of coverage within the pelvic impact area.

**S3.5.2 Folding armrests.** Each armrest that folds into the seat back or between two seat backs shall either—

(a) Meet the requirement of S3.5.1; or

(b) Be constructed of or covered with energy-absorbing material.

**33 F.R. 15794**

**October 25, 1968**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202****Head Restraints—Passenger Cars****(Docket No. 8)**

A proposal to amend § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, by adding a new standard, Head Restraints—Passenger Cars; was published in the *Federal Register* on December 28, 1967 (32 F.R. 20865).

Interested persons have been afforded an opportunity to participate in the making of the amendment.

Several comments requested that the use of a 50th percentile adult male manikin be permitted in demonstrating compliance with the Standard. The Administration feels that a 50th percentile manikin is not representative of a large enough percentage of the public, but recognizes that certain modifications to a 50th percentile manikin may result in a suitable test device. Therefore, the Standard has been modified to permit use of an approved equivalent test device.

A comment from an equipment manufacturer and an equipment manufacturers' association asserted that the Standard should not require that motor vehicle manufacturers provide head restraints at the time of vehicle manufacture, but that each customer should be free to equip his vehicle with head restraints of his own choice, maintaining that the installation of head restraints is a relatively simple matter and that there appears to be virtually no technological advantage in requiring factory installation. The Administration has determined that safety dictates that head restraints be provided on all passenger cars manufactured on or after January 1, 1969, and that a head restraint standard that merely specified performance requirements for head restraint equipment would not insure that all passenger cars would be so equipped, and would not, therefore, meet the need for safety. Furthermore, the Administration has determined that the performance of a head restraint is de-

pendent upon the strength of the structure of the seat to which it is attached, as well as the compatibility of the head restraint with its anchorage to the seat structure.

Some of the comments expressed concern that the proposed Standard would exclude the use of head restraints that are integral with the seat back. The Administration did not intend to imply that "add-on" head restraint devices are the only available means of providing appropriate levels of protection. Such protection may be achieved by the use of a restraint system that is integral with the seat back.

Some comments noted that when testing head restraints that are adjustable to a height of more than 27.5 inches above the seating reference point, the load would not be applied to the appropriate portion of the head restraint. To provide the necessary flexibility, the Standard has been modified to specify that the point of load application and the point of width measurement be determined relative to the top of the head restraint rather than the seating reference point.

Some comments stated that the 8g performance requirement would be incomplete without the inclusion of a time duration requirement. The Administration has concluded that a minimum time duration of 80 milliseconds is appropriate and the Standard has been so modified.

Some comments requested that the location of the head restraint relative to the torso line be measured without a load being applied to the head restraint. The Administration feels that this measurement would be unrealistic and, therefore, the Standard requires that the measurement be taken during the application of the 132-pound initial load.

Many comments requested a more precise description of the method to be used in locating

Effective: January 1, 1969

the test device's reference line and torso reference line. Therefore, the Standard has been modified to provide the necessary clarification.

Some comments claimed that lead time would be a problem; however, the Administration believes that the need to protect the public from neck injury outweighs the possible lead time problems.

Several comments requested clarification of the term "approved representation of a human articulated neck structure." "Approved" is defined in § 371.3(b) as "approved by the Secretary." The Secretary would approve the neck structure of a test device if it could be demonstrated by technical test data that the articulation of the neck structure represented that of a human neck. Approval could only be given to a structure sufficiently described in performance parameters to ensure reliable and reproducible test data.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 202... Effective January 1, 1969.

(Secs. 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966; 15 U.S.C. 1392, 1407; and the delegation of authority of Mar. 31, 1967, 32 F.R. 5606; as amended Apr. 6, 1967, 32 F.R. 6495; July 27, 1967, 32 F.R. 11276; Oct. 11, 1967, 32 F.R. 14277; Nov. 8, 1967, 32 F.R. 15710, and Feb. 8, 1968)

Issued in Washington, D.C., on February 12, 1968.

Lowell K. Bridwell,  
Federal Highway Administrator

33 F.R. 2945  
February 14, 1968

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

### Head Restraints—Passenger Cars

(Docket No. 8)

Motor Vehicle Safety Standard No. 202, issued February 12, 1968, and published in the *Federal Register* February 14, 1968 (33 F.R. 2945), specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions to occupants of passenger cars manufactured after January 1, 1969.

Pursuant to 23 CFR 216.35 (32 F.R. 15818), interested persons could petition the Federal Highway Administrator for reconsideration on or before March 15, 1968.

Several petitioners questioned the 80 millisecond duration requirement of the 8g dynamic test on the grounds that it imposes a more severe load on the seat back than is required in Motor Vehicle Safety Standard No. 207, Anchorage of Seats—Passenger Cars. The Administrator has determined that the demonstration procedure should be revised to incorporate a half-sine wave acceleration pulse shape with an amplitude of 8g and a base (duration) of 80 milliseconds. This revised loading is closer to actual crash conditions, and is more consistent with existing seat strength requirements. The demonstration procedure has been revised to include the half-sine wave pulse shape.

Several petitioners questioned the method for establishing the displaced torso line for the static test on the grounds that it did not take into account the compression of the seat back cushion by the torso under load. The Administrator has determined that the Standard should be revised to take into account seat back cushion compression in establishing the displaced torso line, and the demonstration procedure has been revised accordingly.

One petitioner questioned the procedure outlined for establishing the dummy reference line for the dynamic test. The procedure made use of the torso line of the 95th percentile dummy or test device and there is no commonly accepted definition of this torso line. The Administrator has revised the procedure for establishing dummy torso reference lines to make use of the SAE two-dimensional manikin, with its torso line established in accordance with SAE Aerospace—Automotive Drawing Standards.

One petitioner questioned the requirement that a spherical head form be used to apply the static load because tests have shown that this head form tends to slip under the foundation structure of the head restraint, thus showing an unrealistic loss of load. The Administrator has revised the demonstration procedure to include a cylindrical head form as an alternative.

One petitioner requested that the static load requirement of 200 pounds for head restraints adjusted to a height of 27.5 inches be changed to an equivalent moment about the seating reference point. This would permit the manufacturer who has a head restraint which adjusts higher than 27.5 inches to subject his head restraint to less than a 200 pound static load. This petition is denied. The Administrator has determined that the 200 pound static load should remain in the Standard to ensure that all head restraints sustain this load to meet the needs of safety.

Since this amendment provides clarification, relieves a restriction, and imposes no additional burden, notice and public procedure are unnecessary.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 202, which becomes effective January 1, 1969,



Effective: January 1, 1969

is amended by revising sections 5.1 and 5.2 (relating to the demonstration procedures). . . .

(Secs. 103, 119, National Traffic and Motor Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of March 31, 1967 (32 F.R. 5606), as amended April 11, 1968 (33 F.R. 5803))

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Issued in Washington, D.C., on April 11, 1968.

Lowell K. Bridwell,  
Federal Highway Administrator

**33 F.R. 5793**  
**April 16, 1968**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202****Head Restraints—Passenger Cars****(Docket No. 8)**

Motor Vehicle Safety Standard No. 202 (33 F.R. 2945), as amended (33 F.R. 5793), specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions to occupants of passenger cars manufactured after January 1, 1969.

Paragraph S4(b)(2) of the Standard provides that a head restraint qualifying under the static procedure shall have a lateral width of 10 inches for use with bench-type seats and 6.75 inches for use with individual type seats when measured 2.5 inches below the top of the head restraint.

One manufacturer has petitioned the Administrator for reconsideration of the method by which the lateral width of the head restraint is to be measured. The petitioner requests that the Standard be revised to permit the width to be measured either 2.5 inches below the top of the head restraint or 25 inches above the seating reference point.

Measurement of width 2.5 inches below the top of the head restraint may present possible difficulties for manufacturers of vehicles with head restraints which are integrated into the seat back. These manufacturers may elect to exceed the minimum required height of 27.5 inches to accommodate tall occupants and taper the top portion of the head restraint to provide minimum visibility restriction. In this case, the head restraint, when measured 2.5 inches below the top, might meet the minimum width requirement.

The Administrator has determined that the procedure for measuring head restraint lateral width should be revised since it is in the public interest to encourage the additional protection offered by seat backs higher than the minimum height requirement of this Standard. Accordingly, the Standard is being amended to permit

measurement of head restraint width either 2.5 inches below the top of the head restraint or 25 inches above the seating reference point.

Paragraph S5.1(c) of the Standard provides that the magnitude of the acceleration curve for the dynamic test shall not be less than that of a half-sine wave having the amplitude of 8g and a duration of 80 milliseconds not more than 20% above the half-sine wave.

One manufacturer has requested an interpretation of the term "not more than 20% above the half-sine wave."

It is necessary that a test tolerance be allowed because of equipment variances. However, the tolerance must be properly limited to prevent very severe accelerations which might fail the seat back without properly testing the head restraint. The intent of the "20%" limitation was to establish a half-sine wave upper limit curve having an amplitude of 9.6g and a duration of 96 milliseconds.

Accordingly, the Standard is being amended to require that the magnitude of the acceleration curve be not more than that of a half-sine wave curve having an amplitude of 9.6g and a duration of 96 milliseconds. In addition, the equation for the lower limit curve is being deleted since it imposes an unnecessary restriction on the lateral location of the curve. By removing the equation, the limit curves can then be moved laterally with respect to each other to allow for normal test variances.

Since these amendments provide clarification and an alternate means of compliance, relieve restrictions, and impose no additional burden, I find that for good cause shown notice and public procedure are unnecessary, and that an effective

date for these amendments of less than 180 days is in the public interest.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 202, as amended, is further amended effective January 1, 1969. . . .

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority contained in Section 1.4(c) of Part 1 of the Regu-

lations of the Office of the Secretary of Transportation (49 CFR 1.4(c)).

Issued in Washington, D.C., on October 3, 1968.

Lowell K. Bridwell,  
Federal Highway Administrator

**33 F.R. 15065**  
**October 9, 1968**



## MOTOR VEHICLE SAFETY STANDARD NO. 202

### Head Restraints—Passenger Cars

**S1. Purpose and Scope.** This standard specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions.

**S2. Application.** This standard applies to passenger cars.

**S3. Definitions.** “Head restraint” means a device that limits rearward angular displacement of the occupant’s head relative to his torso line.

**S4. Requirements.** A head restraint that conforms to either (a) or (b) shall be provided at each outboard front designated seating position—

(a) It shall, when tested in accordance with S5.1, during a forward acceleration of at least 8g on the seat supporting structure, limit rearward angular displacement of the head reference line to 45° from the torso reference line; or

(b) It shall, when adjusted to its fully extended design position, conform to each of the following—

(1) When measured parallel to torso line, the top of the head restraint shall not be less than 27.5 inches above the seating reference point;

(2) When measured either 2.5 inches below the top of the head restraint, or 25 inches above the seating reference point, the lateral width of the head restraint shall be not less than—

(i) 10 inches for use with bench-type seats; and

(ii) 6.75 inches for use with individual seats;

(3) When tested in accordance with S5.2, the rearmost portion of the head form shall not be displaced to more than 4 inches perpendicularly rearward of the displaced extended torso reference line during the application of the load specified in S5.2(c); and

(4) When tested in accordance with S5.2, the head restraint shall withstand an increasing load until one of the following occurs—

(i) Failure of the seat or seat back; or

(ii) Application of a load of 200 pounds.

#### S5. Demonstration Procedures.

**S5.1** Compliance with S.4(a) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position:

(a) On the exterior profile of the head and torso of a dummy having the weight and seated height of a 95th percentile adult male with an approved representation of a human, articulated neck structure, or an approved equivalent test device, establish reference lines by the following method:

(1) Position the dummy’s back on a horizontal flat surface with the lumbar joint in a straight line.

(2) Rotate the head of the dummy rearward until the back of the head contacts the same horizontal surface in (1).

(3) Position the SAE J-826 two-dimensional manikin’s back against the flat surface in (1), alongside the dummy with the h-point of the manikin aligned with the h-point of the dummy.

(4) Establish the torso line of the manikin as defined in SAE Aerospace-Automotive Drawing Standards, Sec. 2.3.6, P. E1.01, September 1963.

(5) Establish the dummy torso reference line by superimposing the torso line of the manikin on the torso of the dummy.

(6) Establish the head reference line by extending the dummy torso reference line onto the head.

(b) At each designated seating position having a head restraint, place the dummy, snugly restrained by a Type 1 seat belt, in the manufacturer's recommended design seated position.

(c) During a forward acceleration applied to the structure supporting the seat as described below, measure the maximum rearward angular displacement between the dummy torso reference line and the head reference line. When graphically depicted, the magnitude of the acceleration curve shall not be less than that of a half-sine wave having the amplitude of 8g and a duration of 80 milliseconds and not more than that of a half-sine wave curve having an amplitude of 9.6g and a duration of 96 milliseconds.

**S5.2** Compliance with § 4.(b) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position:

(a) Place a test device, having the back pan dimensions and torso line, (centerline of the head room probe in full back position) of the

three dimensional SAE J-826 manikin, at the manufacturer's recommended design seated position.

(b) Establish the displaced torso reference line by applying a rearward moment of 3300 in. lb. about the seating reference point to the seat back through the test device back pan located in (a).

(c) After removing the back pan, using a 6.5 inch diameter spherical head form or a cylindrical head form having a 6.5 inch diameter in plain view and a 6-inch height in profile view, apply, perpendicular to the displaced torso reference line, a rearward initial load 2.5 inches below the top of the head restraint that will produce a 3300 in. lb. moment about the seating reference point.

(d) Gradually increase this initial load to 200 lbs. or until the seat or seat back fails, whichever occurs first.

**33 F.R. 15065**  
**October 9, 1968**

# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 203

## Impact Protection from the Steering Control System

(Docket No. 74-33; Notice 2)

This notice amends Standard No. 203, *Impact protection from the steering control system*, 49 CFR § 571.203, to exclude from its requirements some passenger cars which meet the frontal barrier crash requirements of Standard No. 208, *Occupant crash protection*, 49 CFR § 571.208.

The NHTSA proposed this exclusion of vehicles from the requirements of Standard No. 203 at the request of General Motors, to permit development of an air cushion restraint system at the driver's position as a means of meeting the frontal barrier crash protection requirements (S5.1) of Standard No. 208 (39 F.R. 34062, September 23, 1974). General Motors sought the exclusion because its modification to the steering control system to incorporate the air cushion system and accept higher loads exerted during a crash makes conformity of the column with Standard No. 203 difficult and sometimes impossible.

Comments were received from General Motors Corporation and Volvo of America Corporation, in support of the proposal. Renault, Inc., Peugeot, Inc., and Mercedes-Benz of North America, Inc., supported the proposal and suggested that the exception be extended to passive restraint systems that incorporate seat belts. These comments argue that the use of passive belts will be high and that the protection offered by Standard No. 203 would in nearly all cases be redundant to that of Standard No. 208.

As a general matter, the NHTSA has maintained that the redundant occupant crash protection offered by standards (e.g., Standard No. 212, *Windshield retention*) is justified for those situations where the primary occupant crash protection system fails, or multiple collisions occur.

Redundant protection is particularly justified in the case of passive seat belts because of the greater likelihood that seat belt protection will be rendered inoperative by an occupant than will crash-deployed protection.

In this case, the NHTSA has made the limited determination that the redundant protection offered by Standard No. 203 is not justified where it directly interferes with development of a more advanced, convenient, and effective restraint system. In contrast, it is obvious that passive systems which utilize belt assemblies do not require modifications of steering control systems and there is, therefore, no reason to sacrifice the redundant protection. These petitions to expand the scope of the proposed exception are accordingly denied.

American Motors Corporation has suggested that an exception not be granted in this case until future requirements of Standard No. 208 are established, and that General Motors' developmental work be undertaken on the basis of a temporary exemption under 49 CFR Part 555. This approach has not been adopted by the NHTSA. In light of the financial commitments that might be involved, this agency has concluded that General Motors is entitled to the assurance that their developments on advanced Standard No. 208 systems will not be barred by Standard No. 203 in the future.

In consideration of the foregoing, paragraph S3 (application) in Standard No. 203 (49 CFR § 571.203) is amended. . . .

*Effective date:* [30 days following date of publication of the amendment in the *Federal Register*]. Because this amendment relieves a restriction, it is found for good cause shown that



an effective date sooner than 180 days from the date of its publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

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Issued on April 17, 1975.

James B. Gregory  
Administrator

**40 F.R. 17992**  
**April 24, 1975**

## PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 203

### Impact Protection for the Driver From the Steering Control System

(Docket No. 78-116; Notice 2)

**ACTION:** Final rule.

**SUMMARY:** This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

**EFFECTIVE DATE:** The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

**ADDRESS:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

**SUPPLEMENTARY INFORMATION:** This notice amends Standard No. 201, *Occupant Protection in Interior Impact*, and Standard No. 203, *Impact Protection for the Driver From the Steering Control System*, to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement*, to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting*, and Standard No. 219-75, *Windshield Zone Intrusion*, led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

### Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars. Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience

less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed rulemaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201, 203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manufacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

### Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done by Sherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly demonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet



pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data

indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA believes that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The

probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

#### *Loading Requirements*

At present, Standard No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

#### *Commercial Vehicles*

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting*, and Standard 219-75, *Windshield Zone Intrusion*. As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.



The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

#### *Walk-In Vans*

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more

slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention*, and 219-75, *Windshields Zone Intrusion*. The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their unique driver/steering column configuration, and thus is exempting walk-in vans for the present.

#### *Belts in Forward Control Vehicles*

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection*. They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

#### *Upgrading of Standard*

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements



may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

#### *Heavy Trucks*

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe

injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

#### *Miscellaneous Comments*

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a head-form representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exceptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

### *Costs and Leadtime*

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been placed in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said

that the cost associated with complying with all three standards was \$30. Ford estimated the cost for compliance with Standard No. 201 as \$10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at \$120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance. Based on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of \$16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a \$27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between \$6 and \$15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design assumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with



the standard. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18-24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford

would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 12, 1979.

Joan Claybrook  
Administrator

**44 F.R. 68470**  
**November 29, 1979**



## MOTOR VEHICLE SAFETY STANDARD NO. 203

### Impact Protection for the Driver from the Steering Control System—Passenger Cars (Docket Nos. 2 and 3; Notice 1)

**S1. Purpose and scope.** This standard specifies requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact.

**S2. Application.** This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. However, it does not apply to vehicles that conform to the frontal barrier crash requirements (S5.1) of Standard No. 208 (49 CFR 571.208) by means of other than seat belt assemblies. It also does not apply to walk-in vans.

**S3. Definitions.** "Steering control system" means the basic steering mechanism and its associated trim hardware, including any portion of a steering column assembly that provides energy absorption upon impact.

**S4. Requirements.** Each passenger car and each multipurpose passenger vehicle, truck and bus with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1981, shall meet the requirements of S5.1 and S5.2.

**S4.1** Except as provided in S4.2, when the steering control system is impacted by a body block in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965 or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds.

**S4.2** A Type 2 seat belt assembly that conforms to Motor Vehicle Safety Standard No. 209 shall be installed for the driver of any vehicle with forward control configuration that does not meet the requirements of S4.1.

**S4.3** The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

#### **S5. Impact protection requirements.**

**S5.1** When the steering control system is impacted by a body block in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965, or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds.

**S5.2** The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

#### **Interpretation**

The term "Jewelry" in paragraph S4.3 refers to watches, rings, and bracelets without loosely attached or dangling members.

**32 F.R. 2414**

**February 3, 1967**



# **PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 204**

## **Steering Control Rearward Displacement**

**(Docket No. 78-116; Notice 2)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

**EFFECTIVE DATE:** The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

**ADDRESS:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

**SUPPLEMENTARY INFORMATION:** This notice amends Standard No. 201, *Occupant Protection in Interior Impact*, and Standard No. 203, *Impact Protection for the Driver From the Steering Control System*, to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement*, to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting*, and Standard No. 219-75, *Windshield Zone Intrusion*, led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards



Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

#### Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars. Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience

less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed rulemaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201, 203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manufacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

#### Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done by Sherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly demonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data

indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the



standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA believes that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The

probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

#### *Loading Requirements*

At present, Standard No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

#### *Commercial Vehicles*

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting*, and Standard 219-75, *Windshield Zone Intrusion*. As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.



The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

#### *Walk-In Vans*

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more

slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention*, and 219-75, *Windshields Zone Intrusion*. The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their unique driver/steering column configuration, and thus is exempting walk-in vans for the present.

#### *Belts in Forward Control Vehicles*

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection*. They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

#### *Upgrading of Standard*

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

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NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

### *Heavy Trucks*

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe

injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

### *Miscellaneous Comments*

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a head-form representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exceptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.



### *Costs and Leadtime*

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been placed in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said

that the cost associated with complying with all three standards was \$30. Ford estimated the cost for compliance with Standard No. 201 as \$10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at \$120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance. Based on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of \$16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a \$27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between \$6 and \$15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design assumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with



the standard. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18-24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford

would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 12, 1979.

Joan Claybrook  
Administrator

**44 F.R. 68470**  
**November 29, 1979**

# **PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 204**

## **Steering Control Rearward Displacement—Passenger Cars**

**(Docket No. 3)**

**ACTION:** Final rule; correction.

**SUMMARY:** On November 29, 1979, NHTSA published in the Federal Register a final rule extending the applicability of Standard No. 204, *Steering Control Rearward Displacement*, to light trucks, buses and multipurpose passenger vehicles with an unloaded vehicle weight of 4,000 pounds or less (44 FR 68470). In amendment number 5 on page 68475 describing the changes made to Standard No. 204, the notice said that a new section S6 was added to the standard. However, the notice did not provide the text for a new section S6. The reference to a new section S6 is an error. No such section was to be added to Standard No. 204. The purpose of this correction is to make clear that the only changes to Standard No. 204 are the amendments to sections S2 and S4 and the addition of a

new section S5. All of those changes are fully described on page 68475 of the November 29, 1979, Federal Register notice.

### **FOR FURTHER INFORMATION CONTACT:**

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

Issued on January 28, 1980.

Michael M. Finkelstein  
Associate Administrator  
for Rulemaking

**45 F.R. 7551  
February 4, 1980**





**MOTOR VEHICLE SAFETY STANDARD NO. 204**  
**Steering Control Rearward Displacement—Passenger Cars**  
**(Docket No. 3)**

**S1. Purpose and scope.** This standard specifies requirements limiting the rearward displacement of the steering control into the passenger compartment to reduce the likelihood of chest, neck, or head injury.

**S2. Application.** This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. However, it does not apply to walk-in vans.

**S3. Definitions.**

“Steering shaft” means a component that transmits steering torque from the steering wheel to the steering gear.

**S4. Requirements.** Each passenger car and each multipurpose passenger vehicle, truck and bus with an unloaded weight of 4,000 pounds or less manufactured on or after September 1, 1981, shall meet the requirements of S5.1.

**S4.1** Except as provided in S4.2, the upper end of the steering column and shaft shall not be displaced horizontally rearward parallel to the longitudinal axis of the vehicle relative to an undisturbed point on the vehicle more than 5 inches, determined by dynamic measurement, in a barrier collision test at 30 miles per hour minimum conducted in accordance with Society of Automotive Engineers Recommended Practice J850, “Barrier Collision Tests,” February 1963.

**S4.2** A Type 2 seat belt assembly that conforms to Motor Vehicle Safety Standard No. 209 shall be installed for the driver of any vehicle with forward control configuration that does not meet the requirements of S4.1.

**S5. Rearward displacement requirements.**

**S5.1** The upper end of the steering column and shaft shall not be displaced horizontally rearward parallel to the longitudinal axis of the vehicle relative to an undisturbed point on the vehicle more than 5 inches, determined by dynamic measurement, when the vehicle, loaded to its unloaded vehicle weight, is impacted perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

**Interpretations**

(1) When conducting the barrier collision test, a driver dummy may be used without measuring the impact force developed on the chest.

(2) In the event that the vehicle impacts the barrier at a velocity not less than 30 miles per hour nor more than 33 miles per hour, the displacement of the steering column may be corrected to 30 miles per hour by means of the following formula:

$$\frac{D_1}{D_2} = \frac{V_1^2}{V_2^2}$$

**32 F.R. 2414**  
**February 3, 1967**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205**  
**Glazing Materials—Passenger Cars, Multipurpose Vehicles, Motorcycles, Trucks, and**  
**Buses**

(Docket No. 9)

Motor Vehicle Safety Standard No. 205 (32 F.R. 2414) as amended (32 F.R. 10072) specifies requirements for glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks, and buses.

As a result of inquiries seeking clarification of the applicability of the Federal motor vehicle safety standards to campers, a ruling was published in the *Federal Register* on March 26, 1968 (FHWA Ruling 68-1) (33 F.R. 5020) which specified that the glazing standard is applicable to slide-in campers because they are items of motor vehicle equipment for use in motor vehicles and to chassis-mount campers.

The glazing standard requires that glazing materials "conform to the United States of America Standards Institute 'American Standard Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,' ASA Standard Z26.1-1966." As a result, windshields and forward facing windows are required to be AS1 laminated glass.

The Federal Highway Administration has received petitions for rule making requesting that forward facing windows on campers be allowed to use AS2 or AS3 laminated glass which is able to meet the Z26.1-1966 penetration resistance test, No. 26, required of AS1 type glass. The requests point out that AS1 type glass which is presently required for forward facing windows in campers is unduly expensive and unnecessary for campers because AS1 type glass must meet stringent optical tests. The petitioners argue that forward facing windows on campers should not have to meet these stringent optical tests because the windows are not used for driver visibility.

The Administrator has determined that granting the petitions would not reduce the protection

afforded the public by the standard. Accordingly the glazing standard is being amended to allow AS2 or AS3 laminated glass in forward facing windows of campers if the glass is able to meet the penetration resistance test. The amendment will require that forward facing windows in campers conform to AS1 type laminated safety glass; or AS2 type laminated safety glass that meets Test 26 of Z26.1-1966; or AS3 type laminated safety glass that meets the requirements of Test 26 of Z26.1-1966. The latter two glazing materials will be identified by the characters AS2-26 and AS3-26 respectively.

The Federal Highway Administration has received a petition for rule making requesting that Standard No. 205 be amended so that paragraph S3.2 Edges be changed to provide that exposed edges must meet the Society of Automotive Engineers Recommended Practice J673a, Automotive Glazing, August 1967, instead of the SAE Recommended Practice J673, Automotive Glazing, June 1960. The petition also requests that the words "except that the minimum edge radius dimension shall not be less than the nominal thickness of the glazing material" be deleted because this requirement is already included in the SAE Recommended Practice J673a. These requests would allow minor imperfections in edging that would not diminish the safety benefits derived from the requirements but would allow normal manufacturing tolerances. These requests are granted and Standard No. 205 is being amended accordingly.

The Administrator has received a petition concerning certification requirements for prime manufacturers of glazing materials; prime glazing material manufacturers being those who fabricate, laminate or temper glazing materials.



The Petitioner states that he has encountered practical problems in the use of certification labels because: (a) glass stored for appreciable lengths of time, covered by the label, may "weather" in a different manner from the remaining areas of the glass (b) labels on individual lights of glass can produce pressure points due to local area loading and may result in breakage during shipment and storage, and (c) certification labels can become separated from the material prior to delivery from consigned stock distributors to non-stocking distributors.

The Petitioner points out that Standard No. 205 requires marking of safety glazing materials in accordance with paragraph 6 of the United States of America Standards Institute (USASI) Standard Z26.1-1966. The Petitioner requests that the permanent marking on the glazing material required by Standard No. 205, with the addition of the symbol "DOT", be allowed as an alternative method of certification required under Section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1401). This petition is granted provided that the symbol "DOT" and an approved two digit manufacturer's code number is included in the permanent marking. Any prime glazing material manufacturer may apply for an approved two digit

manufacturer's code number assignment to the Director, National Highway Safety Bureau, Washington, D.C. 20591.

Since these amendments relieve restrictions, provide alternative means of compliance and create no additional burden the Administrator finds, for good cause shown, that it is in the public interest to make them effective upon date of issuance.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 205 (32 F.R. 2414) as amended (32 F.R. 10072) is amended. . . .

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1392, 1407) and the delegation of authority contained in section 1.4(c) of Part I of the Regulations of the Office of the Secretary (49 CFR 1.4(c)).

Issued in Washington, D.C., on September 13, 1968.

John R. Jamieson, Deputy  
Federal Highway Administrator

33 F.R. 14162  
September 19, 1968

# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205**

## **Glazing Materials**

**(Docket No. 23; Notice 2)**

Motor Vehicle Safety Standard No. 205 specifies requirements for glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks, and buses.

As a result of inquiries seeking clarification of the applicability of the Federal motor vehicle safety standards to campers, a ruling was published in the *Federal Register* on March 26, 1968 (33 F.R. 5020), which specified that the glazing standard (No. 205) is applicable to slide-in campers because they are items of motor vehicle equipment for use in motor vehicles.

Standard No. 205 requires, among other things, that glazing materials "conform to the United States of America Standards Institute 'American Standard Safety Code of Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,' ASA Standard Z26.1-1966" (hereafter Z26.1-1966).

By order published in the *Federal Register* on September 19, 1968 (33 F.R. 14162), section S3.2 of the Standard was amended to allow the use of AS2 or AS3 laminated glass in forward facing windows of campers provided such glass met the requirements of Test 26 of Z26.1-1966. On the assumption that Z26.1-1966, as incorporated in Standard No. 205, required the use of AS1 type laminated glass in forward facing windows of campers, the Administrator found that this amendment relieved restrictions, provided alternate means of compliance and created no additional burdens. Accordingly, the amendment was made effective immediately.

Thereafter, petitions for reconsideration were filed on the grounds, among others, that properly interpreted Z26.1-1966 permitted the use of AS1, AS2, AS3, AS4, and AS5 glazing material in forward facing camper windows and that, there-

fore, the September amendment did not relax an existing requirement but in fact imposed additional restrictions upon manufacturers by limiting the types of glazing materials allowable for use in such windows. Consequently, it is urged that notice of that amendment should have been given and interested parties afforded an opportunity to comment.

The Administrator recognizes that, prior to the issuance of the September amendment, Standard No. 205 as initially promulgated could have been reasonably interpreted as allowing the use of AS1, AS2, AS3, AS4, and AS5 glazing materials in the forward facing windows of campers, that many manufacturers could have reasonably acted in reliance upon such a reading, that a great deal of confusion concerning the requirements has and continues to exist and that, in fact, comments focusing directly upon the proper glazing materials required in forward facing windows of campers have not been specifically solicited by the Administration. In the light of all of these circumstances it is considered appropriate to revoke section S3.2—"Materials for use in forward facing windows of campers" of Federal Motor Vehicle Safety Standard No. 205, as amended (33 F.R. 14162), as well as any interpretation that would have required the use of AS1 glass only in forward facing camper windows. The net effect of this action is to permit, subject to further rulemaking action,<sup>1</sup> the use of glazing materials that petitioners represent are presently being used, i.e., AS1, AS2, AS3, AS4, and AS5 glazing materials referred to in Z26.1-1966.

Since this amendment relieves restrictions and creates no additional burden the Administrator finds good cause is shown that an effective date earlier than 180 days after issuance in the

Effective: March 1, 1969

public interest and the amendment is made effective upon date of issuance.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 205 as amended (33 F.R. 14162) is amended by revoking S3.2—"Materials for use in forward facing windows of campers".

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority contained in

§ 1.4(c) of Part 1 of the regulations of the Office of the Secretary (49 CFR 1.4(c))

Issued: February 27, 1969.

John R. Jamieson, Deputy  
Federal Highway Administrator

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<sup>1</sup>See notice of proposed rule making published at 34 F.R. 3699, which proposes glazing requirements for forward facing windows of campers.

**34 F.R. 3688**  
**March 1, 1969**



## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205**

### **Glazing Materials**

**(Docket No. 71-1; Notice 3)**

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 205, "Glazing Materials," to permit the use of certain plastic materials in motor vehicles in addition to those presently allowed; to modify the certification and labeling requirements; and to modify the test for the chemical resistance of plastic materials. It also clarifies the applicability of the standard to motor vehicle equipment, and the provisions of the standard dealing with readily removable windows.

Federal Motor Vehicle Safety Standard No. 205 was initially published February 3, 1967 (32 F.R. 2414), and amended July 8, 1967 (32 F.R. 10072), September 19, 1968 (33 F.R. 14162), and March 1, 1969 (34 F.R. 3688). On January 9, 1971, a notice of proposed rulemaking (Docket 71-1, Notice 1) was published based upon petitions for rulemaking received from the Eastman Chemical Products, Inc., and the California Highway Patrol. The former requested that the standard be amended to allow the use of butyrate plastic materials, and the latter requested changes in the requirements of the standard dealing with the marking of glazing materials. This amendment responds to both of these petitions and also modifies the standard as a result of independent agency action.

Standard No. 205 is applicable to "glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses and motorcycles." It is also applicable, under FHWA Ruling 68-1 (33 F.R. 5020, March 26, 1968), to glazing for use in slide-in and chassis-mount campers. This amendment to Standard No. 205 incorporates the substance of FHWA Ruling 68-1 into the applicability section of the standard and specifies, in accordance with the notice of March 1, 1969 (Docket 23; Notice 2, 34 F.R. 3688) the glazing

materials that are permitted to be used in these equipment items.

The notice of January 9, 1971, proposed to revise the incorporation by reference of American Standards Association Test (ASA) Z26.1-1966 to include supplement Z26.1a-1969, March 7, 1969, and to reflect the change in the name of the American Standards Association to the American National Standards Institute. No objections were raised in the comments to these proposals, and they are incorporated into the standard by this amendment.

The notice proposed to modify the chemical resistance tests incorporated into the standard (Tests 19 and 20), by deleting carbon tetrachloride as a testing agent and by adding trichloroethylene. The tests are designed to test the resistance of plastic materials to chemicals that are commonly used to clean them. By this notice, carbon tetrachloride is deleted from the list of materials. As indicated in the notice of proposed rulemaking, the deletion is commensurate with the ban imposed by the Food and Drug Administration on this substance because of its high toxicity. At the same time, the NHTSA has decided not to include either trichloroethylene or freon in the list of testing agents. The comments have indicated that these substances are not commonly used as cleaning agents, and accordingly they are not used for test purposes.

The major revision proposed by the notice, based upon a petition for rulemaking from the Eastman Chemical Products Co., Inc., was to allow additional plastic materials to be used in motor vehicles. The petitioner claimed that the requested materials would meet any test to which other plastic materials are subjected, except for resistance to undiluted denatured alcohol (For-

mula SD 30), where a slight tackiness would occur. Rather than merely exempt these plastics from the alcohol resistance requirement, the notice suggested that they still be subjected to the same chemicals as other plastics, but that if structural integrity were maintained, a loss of transparency would be allowed. The notice for the same reason proposed not to subject these materials to the abrasion and weathering tests applied to other plastics. Instead, the proposal would have required labels to be affixed to the material specifying cleaning agents and instructions that would minimize loss of transparency, and would have restricted them to locations in motor vehicles where loss of transparency would not affect driver visibility.

Based upon information received during the rulemaking process, the NHTSA has determined that the materials in question exhibit characteristics which make them satisfactory from the standpoint of safety for use in certain motor vehicle applications. Many comments, however, opposed the approach taken by NHTSA in the proposed rule, and as a result the proposed requirements have been changed. The standard as now amended will provide that these materials not be required to show resistance to undiluted denatured alcohol if (1) they show resistance to the other chemicals presently specified as testing agents, (2) they can meet the other tests to which other plastic materials are subjected, and (3) they are used in only limited locations in the motor vehicle. In addition, they must be labeled, as proposed, with instructions regarding cleaning that will minimize a loss of transparency.

Some comments also objected to certain locations where the additional plastic materials would have been allowed to be used: specifically, auxiliary wind deflectors and folding doors. The comments suggested that transparency is an important characteristic for glazing used in these locations, and that materials not resistant to Formula SD 30 alcohol should not be used in them. The NHTSA has determined that these comments have merit, and has not permitted these materials to be used in the two locations.

The notice of proposed rulemaking would have required all interior mirrors, both rearview and vanity-type, to be constructed of glazing ma-

terials that meet the requirements of ANS Z26. As a result of comments received, the NHTSA has determined that the requirements should not be applied to interior mirrors. With regard to rearview mirrors, many are today constructed of annealed glass of a wedge shape, in the form of day/night mirrors. The comments have indicated that materials allowed to be used pursuant to ANS Z26 do not make satisfactory day/night mirrors. As these mirrors have clear safety advantages when used in night driving conditions, the NHTSA has determined that their elimination would not be in the best interests of safety. With reference to other vehicle interior mirrors, while the use of safety glazing in them is preferable, there is presently a lack of data which shows a compelling need for changing current industry practices. This is especially important where, as here, much of the equipment involved is not peculiarly adapted to motor vehicle usage. One particular type of mirror, a sun-visor mirror, falls within the purview of Motor Vehicle Safety Standard No. 201, "Occupant Protection in Interior Impact," and will be dealt with as part of that standard.

The notice of proposed rulemaking prescribed a scheme for the marking and certification of glazing materials which would have required prime glazing manufacturers to certify glazing materials by applying to the glazing material the symbol DOT and an appropriate code mark, together with the marking required by section 6 of ANS Z26. The proposal would have also required these markings to be in a specified format and in a specific location of the completed glazing. Other than primary manufacturers would have been required to certify the material by affixing the mark of the primary manufacturer.

As amended Standard No. 205 will require prime manufacturers to certify glazing material, as proposed, by adding to the markings required by section 6 of ANS Z26 the symbol DOT and a code mark obtained on application to the NHTSA. Those who as manufacturers or distributors cut glazing for use in motor vehicles from larger sheets are required to certify conformity to the standard in any way they choose, as long as the method chosen is consistent with Section 114 of the National Traffic and Motor



Vehicle Safety Act. One such method would be to affix a label to the completed piece of glazing containing a statement to the effect that the material conforms to Standard No. 205. The proposed requirement that such manufacturers label the material with the marking of the prime manufacturer has been deleted, as is the proposed requirement that would have required the markings to appear in a specified order, or in specific locations on the glazing material.

An issue arose during the period that this rulemaking was under consideration concerning the use of plastics in side windows of buses. General Motors has requested an interpretation of Standard No. 205 that would include within the definition of "readily-removable windows" emergency escape windows which can be pushed out, except for one side which is hinged to the window frame, without the use of any special tools. The NHTSA has concluded that the term "readily removable windows" includes windows of this design, and in this amendment so clarifies Standard No. 205.

*Effective dates:* The addition of glazing materials to those already allowed imposes no additional burdens on any person, and relieves restrictions on the types of glazing materials

which can be used. That part of the amendment pertaining to the addition of these materials, paragraphs S5.1.1.2, S5.1.1.3, and S5.1.2, is effective upon publication of this notice in the *Federal Register*. Similarly, both the deletion of the test for chemical resistance of plastics to carbon tetrachloride in paragraph S5.1.1.1, and the clarification of "readily-removable windows" in S5.1.1.4 relieve restrictions, and the effective date of those amendments is the date of publication of this notice. The other amendments to the standard are effective April 1, 1973.

In light of the above, Motor Vehicle Safety Standard No. 205, appearing at 49 CFR section 571.205, is revised. . . .

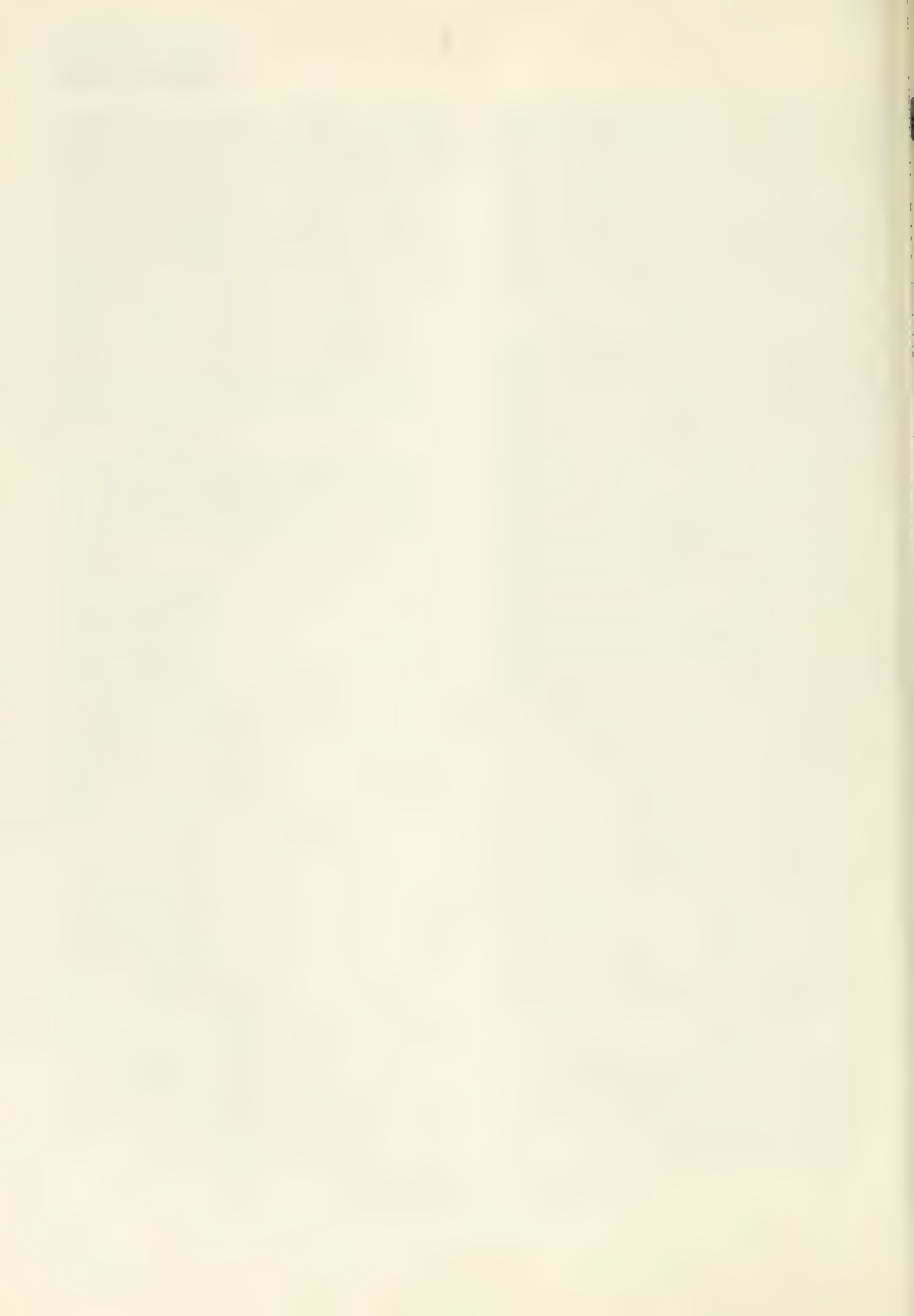
This notice is issued pursuant to the authority of sections 103, 114, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1403, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on June 14, 1972.

Douglas W. Toms  
Administrator

37 F.R. 12237  
June 21, 1972





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

### Glazing Materials

(Docket 71-1; Notice 4)

This notice responds to petitions for reconsideration of an amendment published June 21, 1972 (37 F.R. 12237), to Motor Vehicle Safety Standard No. 205, "Glazing Materials" (49 CFR § 571.205). Petitions were received from the Recreational Vehicle Institute (RVI) and the California Highway Patrol. To the extent that this notice does not grant the requests of the petitioners, they are hereby denied.

In the amendment of June 21, the NHTSA changed the application section of the standard, based on FHWA Ruling 68-1 (33 F.R. 5020, March 26, 1968) to expressly include glazing for use in all campers, and defined campers to include both slide-in or "pickup" campers (including a related item, pickup covers) and chassis-mount campers (campers mounted directly onto truck chassis). The 1968 ruling held that Standard No. 205 applied to glazing for use in slide-in campers, and that glazing for use in chassis-mount campers came within the standard when the camper was ultimately attached to a chassis, as the standard applied expressly to the glazing of the completed vehicle, a multipurpose passenger vehicle. The petitioner objects to this amendment on the basis that the recreational vehicle industry has distinguished between the two camper types, and has considered the latter a motor home (a multipurpose passenger vehicle under Standard No. 205), and the former an item of motor vehicle equipment. It requests in its petition that this earlier distinction be retained in the standard.

The NHTSA has determined that the petition of RVI in this regard should be granted, and the applicability section of the standard is amended to refer specifically both to glazing for use in "slide-in campers", as that term is defined in

Motor Vehicle Safety Standard No. 126, Truck-Camper Loading, (49 CFR 571.126), and to glazing for use in pickup covers. Chassis-mount campers are included in a newly defined category of multipurpose passenger vehicle, "motor home", and glazing for use in them is subject to the standard insofar as they are incorporated into completed vehicles.

The RVI petition also requested that the requirements of the standard for glazing for use in multipurpose passenger vehicles (including chassis-mount campers and other motor homes) be clarified, suggesting that the requirements be made identical to those for passenger car glazing, with an exception in the case of motor homes for locations other than windshields, and windows directly to the right and left of the driver. It further requested that forward-facing windows of motor homes be considered to be "openings in the roof" under ANS Z.26. The NHTSA has previously, as a matter of interpretation, taken the position that is embodied in this amendment, that for the purposes of Standard No. 205 glazing for use in multipurpose passenger vehicles is subject to the requirements for glazing for use in trucks. This is based on the definition of multipurpose passenger vehicle in section 571.3: "A motor vehicle with motive power, except a trailer, designed to carry 10 persons or less, which is constructed either on a truck chassis or with special features for occasional off-road operation". The agency has decided to adhere to this position.

An exception is hereby adopted for motor home windows other than windshields, forward-facing windows, and windows directly to the right and left of the driver. Manufacturers may use in these other locations any type of glazing

allowed by the standard to be used in motor vehicles. This is the position previously adopted for slide-in campers, which have a purpose and use similar to motor homes. The effect of this provision is to allow the use in motor homes, except for windshields, forward-facing windows, and windows to the immediate right and left of the driver, of any item authorized for use in motor vehicles by Standard No. 205. Windshields and windows to the immediate right and left of the driver must conform to the requirements applicable to trucks for those locations. Forward-facing windows may be manufactured of any item authorized for use by the Standard except item 6 (AS 6), item 7 (AS 7), and item 13 (AS 13) flexible plastics.

The California Highway Patrol has petitioned for reconsideration of that part of the amendment which seemed to delete a requirement that persons who cut glazing material must place on the cut material the prime manufacturer's marking. Section 6 of ANS Z26 requires sections of glazing cut from pieces bearing the markings required by that section to be identically marked. The June 21 notice did not delete this provision. It deleted that part of the proposed requirements specifying that persons who cut glazing materials include the DOT symbol and the prime manufacturer's code number. The language of the preamble (p. 12238, col. 3) was intended to reflect only that fact. This amendment clarifies those requirements to make it clear that persons who cut glazing must include the markings re-

quired by section 6 of ANS Z26 on each cut piece. The amendment also provides that the prime manufacturer's DOT symbol and code number are to be affixed only to glazing items made by the prime manufacturer as components for specific vehicles, and not on sheets to be cut into components by other persons.

The marking provisions are further amended to specify that the new items of glazing material authorized by the amendment of June 21 be identified for purposes of marking by the marks "AS 12" and "AS 13". The use of these marks does not indicate approval by the American National Standards Institute, but is specified for the purpose of consistency with existing marking requirements.

In light of the above, Motor Vehicle Safety Standard No. 205, Glazing Materials, appearing at 49 CFR § 571.205, is amended . . . .

*Effective date:* The effective date of April 1, 1973, is retained.

This notice is issued under the authority of Section 103, 114, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1403, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on November 8, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 24035**  
**November 11, 1972**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

## Glazing Materials

(Docket No. 71-1; Notice 06)

This notice amends Safety Standard No. 205, *Glazing Materials*, to permit the use of rigid plastic glazing in all doors and windows of buses, other than in windshields or in windows to the immediate right or left of the driver.

Effective Date: December 5, 1977.

For Further Information Contact:

Hugh Oates  
National Highway Traffic Administration  
Washington, D.C. 20590  
(202-426-9511)

**Supplementary Information:** This amendment of Safety Standards No. 205 (49 CFR 571.205) is based on a proposal issued December 30, 1976 (41 FR 56837), in response to a petition for rulemaking from General Motors Corporation. Standard No. 205 currently permits plastic glazing materials to be used in buses only in standee windows and in readily removable windows of buses having a GVWR of more than 10,000 pounds. This amendment expands the permissible locations for plastic glazing in buses of all sizes to include all doors and windows, other than windshields or windows to the immediate right or left of the driver.

As noted in the preamble to the proposal, use of plastics in bus side windows should reduce the safety hazards and maintenance costs resulting from the deliberate breakage of bus windows, since plastic glazing is more difficult to break than regular glass. Further, Safety Standard No. 217, *Bus Window Retention and Release*, (49 CFR 571.217) now provides for emergency occupant egress in buses. One of the reasons for the original prohibition against plastic glazing was the fact it would be difficult to break in emergency situations. Since the issuance of

Standard No. 217, the prohibition is no longer necessary.

Comments to the proposal preceding this amendment were submitted by Ford Motor Company, the Flexible Company, and the Department of California Highway Patrol. All three commenters supported the proposed changes. California noted the experimental use of plastic glazing in side windows of buses by the Southern California Rapid Transit District. That experiment showed that plastic glazing is superior to glass with regard to resistance to breakage. Further, California noted that the abrasion-resistance coating on the plastic glazing used in the experiment was sufficient to reduce scratching by wash-rack brushes to an acceptable level, during normal cleaning of the buses.

The proposal specified the use of plastic glazing in all doors and windows, other than windshields and windows to the immediate right or left of the driver, of buses having a GVWR of more than 10,000 pounds. Ford Motor Company recommended that the proposed changes be made applicable to all buses, regardless of gross vehicle weight rating. The NHTSA has determined that Ford's comment has merit since small buses are also now provided with means of emergency egress (Standard No. 217) and since multipurpose passenger vehicles and trucks are currently permitted to have plastic glazing in windows to the rear of the driver. The basic distinction between a small bus under 10,000 pounds GVWR and a van multipurpose passenger vehicle or van truck is the number of designated seating positions. Thus, the safety considerations for these vehicles are generally the same. The proposal is, therefore, made final in a form that includes all buses.

The Flxible Company supported the proposed changes and also recommended that the standard be amended to permit the use of Item 4 and Item 5 plastic glazing in front of "destination and route numbering signs" on buses and in front of interior displays such as route maps or advertisements. Since these changes were not proposed, the NHTSA will consider them in future rule-making actions.

This amendment should have only a minimal economic and environmental impact, since it relieves a restriction and since the increased use of plastics that may result will have a negligible effect upon the environment.

(Because this amendment relieves a restriction and does not create additional obligations for

any person, it is found that an immediate effective date is in the public interest.)

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 205, *Glazing Materials* (49 CFR 571.205), is amended as follows . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 28, 1977.

Joan Claybrook  
Administrator

**42 F.R. 61465**  
**December 5, 1977**

# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205**

## **Glazing Materials (Docket No. 71-1; Notice No. 8)**

**ACTION:** Final rule (interpretive amendment).

**SUMMARY:** In response to a petition for rulemaking, this notice amends Safety Standard No. 205, Glazing Materials, to clarify that Item 5 rigid plastics can be used in all the vehicle locations that are specified in the standard for Item 12 rigid plastics, and that Item 7 flexible plastics can be used in all the vehicle locations that are specified in the standard for Item 13 flexible plastics. Glazing materials that comply with Item 5 and Item 7 test requirements, by definition, also comply with the less stringent Item 12 and 13 test requirements, respectively. Currently, however, the standard inadvertently prohibits the use of Items 5 and 7 glazing materials in some of the locations in which the Items 12 and 13 materials may be used. The purpose of this amendment is to modify the standard to remove that inconsistency.

**DATES:** Effective date (upon publication), July 14, 1980.

**ADDRESSES:** Any petition for reconsideration should refer to the docket number and notice number specified in this notice and be submitted to Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. Edward Jettner, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:** Safety Standard No. 205, Glazing Materials (49 CFR 571.205), specifies performance requirements for vehicle

glazing as well as the locations in which particular types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1-1966 (hereinafter ANS Z26). The ANS Z26 standard defines the various types of glazing in terms of performance tests with which a particular "Item" must comply. There are currently 13 Items or types of glazing specified in the standard.

Safety Standard No. 205 was amended in 1972 to allow two additional types of glazing for use in specified vehicle locations not required for driving visibility (37 FR 12237, June 21, 1972). The first new glazing type was rigid plastic described as "Item 12", and the second was flexible plastic described as "Item 13". The test requirements specified for Item 12 are identical to the test requirements for Item 5 rigid plastics, and the test requirements for Item 13 are identical to the test requirements for Item 7 flexible plastics, except that neither Item 12 nor 13 is required to meet the test for resistance to undiluted denatured alcohol (Formula SD No. 30). Therefore, the performance requirements of the standard are more stringent for Items 5 and 7 than for Items 12 and 13, respectively, because of the one additional test with which the former must comply.

When Items 12 and 13 were added to the standard, several locations in which the types could be used were specified which were not included for Items 5 and 7. Thus, the standard specifies that Item 12 plastics may be used as motorcycle windcreens, but there is no such specification for Item 5 plastics. Similarly, the standard allows Item 13 plastics to be used in standee windows in buses, interior partitions, and in openings in the roof, but does not specify these locations for Item 7 plastics.



Since Item 5 and 7 glazing materials must meet more stringent requirements, they should be allowed in all vehicle locations in which Items 12 and 13 may be used. Last year, the Rohm and Haas Company petitioned the agency to amend Safety Standard No. 205 to remove this inconsistency. This notice responds to that petition.

The agency agrees that the standard is currently inconsistent with regard to the locations in which the various types of rigid and flexible plastics may be used. When Items 12 and 13 were added to the standard, the agency inadvertently failed to expand the list of permitted locations for Items 5 and 7 so that the list would include all of the locations specified for Items 12 and 13. (The agency wishes to point out that there are several locations specified for Items 5 and 7 in which Items 12 and 13 may not be used. This is appropriate since the performance requirements for Items 5 and 7 are more stringent.)

The agency has determined that the change requested by the petitioner can be accomplished by interpretive amendment and that opportunity for public comment is not required. Items 5 and 7 glazing also qualify as Items 12 and 13, respectively, because an item of glazing is only defined in the standard in terms of the test requirements it can meet. Since Items 5 and 7 glazing comply with all the test requirements specified for Items 12 and 13, manufacturers would be permitted to mark a particular piece of glazing as Item 12 or 13 and to use the glazing in the locations specified for those Items, even though that piece of glazing could also pass the additional test requirement for the higher-grade plastics, Items 5 or 7. There is nothing in the standard which requires a specific piece of glazing to be labeled with the highest performance Item number with which it can qualify, although for practical purposes this is generally done. In other words, Items 12 and 13 glazing are lower performance forms of Items 5 and 7 glazing. Therefore, Items 5 and 7 can be used wherever Items 12 and 13 may be used in the vehicle. This notice amends Standard No. 205

to clarify this point by making the necessary additions to the list of locations currently specified for Items 5 and 7.

Since this amendment removes a current inconsistency in the standard, the agency has determined that an immediate effective date is in the public interest.

The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12044 and the Departmental directives implementing that Order. Since the amendment only clarifies existing requirements, there should be negligible cost or environmental impacts resulting from this modification. Therefore, no regulatory evaluation has been prepared.

The engineer and lawyer primarily responsible for the development of this amendment are Edward Jettner and Hugh Oates, respectively.

In consideration of the foregoing, Safety Standard No. 205, 49 CFR 571.205, is amended as set forth below.

1. Paragraph S5.1.1.2 is amended by adding a new subparagraph "(m)" to read:

"(m) for Item 5 safety glazing only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position."

2. Paragraph S5.1.1.3 is amended by adding the following phrase and new subparagraphs "(l), (m) and (n)" after existing subparagraph (k), to read:

"For Item 7 safety glazing only:

(l) Standee windows in buses.

(m) Interior partitions.

(n) Openings in the roof."

Issued on July 1, 1980.

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Joan Claybrook  
Administrator

45 FR 47150  
July 14, 1980

## MOTOR VEHICLE SAFETY STANDARD NO. 205

### Glazing Materials

**S1. Scope.** This standard specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment.

**S2. Purpose.** The purpose of this standard is to reduce injuries resulting from impact to glazing surfaces, to ensure a necessary degree of transparency in motor vehicle windows for driver visibility, and to minimize the possibility of occupants being thrown through the vehicle windows in collisions.

**S3. Application.** This standard applies to glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses, motorcycles, slide-in campers, and pickup covers designed to carry persons while in motion.

#### **S4. Definitions.**

"Camper" means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

"Motorhome" means a multipurpose passenger vehicle that provides living accommodations for persons.

"Pickup cover" means a camper having a roof and sides but without a floor, designed to be mounted on and removable from the cargo area of a truck by the user.

"Slide-in camper" means a camper having a roof, floor, and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

#### **S5. Requirements.**

##### **S5.1 Materials.**

**S5.1.1** Glazing materials for use in motor vehicles, except as otherwise provided in this standard, shall conform to the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on

Land Highways," Z26.1—1966, July 15, 1966, as supplemented by Z26.1a—1969, March 7, 1969 (hereinafter referred to as "ANS Z26").

**S5.1.1.1** The chemicals specified for testing chemical resistance in Tests Nos. 19 and 20 of ANS Z26 shall be:

(a) One percent solution of nonabrasive soap.

(b) Kerosene.

(c) Undiluted denatured alcohol, Formula SD No. 30 (1 part 100-percent methyl alcohol in 10 parts 190-proof ethyl alcohol by volume).

(d) Commercial motor car gasoline.

(Effective: 6/21/72)

**S5.1.1.2** The following locations are added to the lists specified in ANS Z26 in which item 4 and item 5 safety glazing may be used:

(j) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(k) Windows and doors in slide-in campers and pickup covers.

(l) Windows and doors in buses except for the windshield, windows to the immediate right or left of the driver, and rearmost windows if used for driving visibility.

[(m) For Item 5 safety glass only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating positions. (45 F.R. 47151—July 14, 1980. Effective: 7/14/80)]

**S5.1.1.3** The following locations are added to the lists specified in ANS Z26 in which item 6 and item 7 safety glazing may be used:

(j) Windows and doors in motorhomes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

(k) Windows, except forward-facing windows, and doors in slide-in campers and pickup covers.

For Item 7 safety glazing only:

(l) Standee windows in buses.

(m) Interior partitions.

(n) Openings in the roof.



**S5.1.1.4** The following locations are added to the lists specified in ANS Z26 in which item 8 and item 9 safety glazing may be used:

(f) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(g) Windows and doors in slide-in campers and pickup covers.

**S5.1.1.5** The phrase "readily removable windows" as defined in ANS Z26, for the purposes of, this standard, in buses having a GVWR of more than 10,000 pounds, shall include pushout windows and windows mounted in emergency exits that can be manually pushed out of their location in the vehicle without the use of tools, regardless of whether such windows remain hinged at one side to the vehicle.

**S5.1.1.6 Multipurpose passenger vehicles.** Except as otherwise specifically provided by this standard, glazing for use in multipurpose passenger vehicles shall conform to the requirements for glazing for use in trucks as specified in ANS Z26.

**S5.1.2** In addition to the glazing materials specified in ANS Z26, materials conforming to S5.1.2.1 or S5.1.2.2 may be used in the locations of motor vehicles specified in those sections.

**S5.1.2.1 Item 12—Rigid plastics.** Safety plastic materials that comply with Tests Nos. 10, 13, 16, 17, 21, and 24 of ANS Z26, Tests Nos. 19 and 20 of ANS Z26 with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and the labeling requirements of S5.1.2.3, may be used in a motor vehicle only in the following specific location at levels not requisite for driving visibility.

(a) Windows and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(b) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(h) Windows and doors in buses except for the windshield and windows to the immediate right or left of the driver.

**S5.1.2.2 Item 13—Flexible plastics.** Safety plastic materials that comply with Tests Nos. 16, 22, and 23 or 24 of ANS Z26, Tests Nos. 19 and 20 of ANS Z26 with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and the labeling requirements of S5.1.2.3, may be used in a motor vehicle only in the following specific locations at levels not requisite for driving visibility.

(a) Windows, except forward-facing windows, and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motorhomes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

**S5.1.2.3 Cleaning instructions.** Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1 or S5.1.2.2 shall affix a label, removable by hand, to each item of such glazing material. The label shall specify instructions and agents for cleaning the materials that will minimize the loss of transparency.

**S5.2 Edges.** In vehicles except school buses, exposed edges shall be treated in accordance with SAE Recommended Practice J673a, "Automotive Glazing," August 1967. In school buses, exposed edges shall be banded.



**S6. Certification and marking.**

**S6.1** Each prime glazing material manufacturer, except as specified below, shall mark glazing materials manufactured by him in accordance with section 6 of ANS Z26. The materials specified in S5.1.2.1 and S5.1.2.2 shall be identified by the marks "AS 12" and "AS 13" respectively. A prime glazing material manufacturer is one who fabricates, laminates, or tempers the glazing material.

**S6.2** Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed as a component of any specific motor vehicle or camper, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act of 1966, by adding to the mark required by S6.1 in letters and numerals of the size specified in section 6 of ANS Z26, the symbol "DOT" and a manufacturer's code mark, which will be assigned by the NHTSA on the written request of the manufacturer.

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**S6.3** Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed to be cut into components for use in motor vehicles or items of motor vehicle equipment, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act.

**S6.4** Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall mark that material in accordance with section 6 of ANS Z26.

**S6.5** Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall certify that his product complies with this standard in accordance with section 114 of the National Traffic and Motor Vehicle Safety Act.

**37 F.R. 12237  
June 21, 1972**



## **PREAMBLE TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 206**

### **Door Lock and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles, and Trucks**

**(Docket No. 2-16)**

A proposal to further amend Federal Motor Vehicle Safety Standard No. 206, extending its applicability to multipurpose passenger vehicles and trucks, was published in the *Federal Register* on December 28, 1967 (32 F.R. 20868).

Interested persons have been afforded an opportunity to participate in the making of this amendment. Their comments and other available information have been carefully considered.

Ejection from passenger cars and trucks, upon impact, has proven to be a primary cause of occupant injury and death. Standard No. 206 was issued to minimize the likelihood of occupants being thrown from passenger cars by providing, among other things, load requirements for door latches and door hinge systems. A study conducted by the Cornell Aeronautical Laboratory disclosed that the rate of occupant ejection from trucks is almost twice that of recent-model passenger cars. Moreover, the study revealed that the rate of severe and fatal injuries among truck drivers who have been thrown from vehicles is four times that of drivers who remained in the vehicle after impact. Extending the requirements of Standard 206 to trucks and multipurpose passenger vehicles clearly meets the need for motor vehicle safety. This conclusion is concurred in generally by the commenters.

Several changes have been made in the text of the standard from that which appeared in the Notice of Proposed Rule Making. The title of the standard has been changed to more accurately describe the items dealt with in the standard. In addition, in response to some of the comments submitted, the category of side doors previously referred to as "hinged doors" has been divided

into two new groups—"hinged cargo-type doors" and "hinged doors except cargo-type doors," and separate load requirements and demonstration procedures have been prescribed for each. In light of other comments submitted, the demonstration procedure for "sliding doors" has also been changed for reasons of practicability. Further, a definition of the term "cargo-type doors" has been inserted in the standard. The term "temporary doors" referred to and defined in the notice has been deleted. Finally, several other changes have been made for clarification purposes only.

No multipurpose passenger vehicle manufacturer objected to the proposed effective date of this amendment, January 1, 1970. On the other hand, one heavy truck manufacturer specifically objected to the proposed effective date on the ground that additional lead time would be needed to redesign, test, and retool, in order to comply with the amended standard. Several other truck manufacturers also considered the lead time to be insufficient. A January 1, 1972 effective date for trucks was proposed by the aforesaid heavy truck manufacturer. The Administrator concludes that there is merit to his objection. Heavy truck manufacturers will require more time than was originally anticipated to take the steps necessary to comply with the standard. Accordingly, the effective date of this amendment, insofar as trucks are concerned, is extended to January 1, 1972.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 206, as amended, 49 C.F.R. § 371.21, is amended to read as set forth below, effective January 1, 1970, for passenger cars and multipurpose passenger vehicles, and January 1, 1972, for trucks.



Effective: January 1, 1970  
January 1, 1972

This rule-making action is taken under authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority contained in Part I of the Regulations of the Office of the Secretary of Transportation (49 CFR 1.4(c)).

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Issued on January 17, 1969.

Lowell K. Bridwell,  
Federal Highway Administrator

34 F.R. 1150  
January 24, 1969

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 206****Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles and Trucks****(Docket No. 2-16)**

Federal Motor Vehicle Safety Standard No. 206 (49 CFR 371.21), as amended (34 F.R. 1151), specifies strength requirements for door locks and door retention components on passenger cars, multipurpose passenger vehicles, and trucks.

Paragraph S4. of Standard 206 exempts components of detachable doors for vehicles manufactured for use without doors from the requirements of the standard. This was done because such doors are provided not for the purpose of retaining the driver and passengers in case of collision but only as protection from inclement weather.

One manufacturer has noted that strength requirements are equally inapplicable to components of folding and roll-up doors and has petitioned for an amendment which would treat such doors in the same manner as detachable doors. It has been determined that the petition has merit. Accordingly, the standard is amended to remove folding and roll-up doors from the requirements of the standard.

In consideration of the foregoing, paragraph S4. of Federal Motor Vehicle Safety Standard No. 206 is amended to read as follows:

**S4. Requirements.** Side door components referred to herein shall conform to this standard if any portion of a 90-percentile two-dimensional

manikin as described in SAE Practice J826, when positioned at any seating reference point, projects into the door opening area on the side elevation or profile view. Components on folding doors, roll-up doors and doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors need not conform to this standard.

\* \* \* \* \*

*Correction:* The paragraph title "S5.2.3 *Sliding Doors*" of Federal Motor Vehicle Safety Standard No. 206 is changed to read "S5.3 *Sliding Doors*".

Since this amendment relaxes a requirement and imposes no additional burden on any person, notice and opportunity to comment thereon are unnecessary, and it becomes effective on publication in the *Federal Register*. This notice of amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the Federal Highway Administrator, 49 CFR 1.4(c).

Issued on August 14, 1969.

F. C. Turner  
Federal Highway Administrator





## **PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO 206**

### **Door Locks and Retention Components**

**(Docket No. 71-5; Notice 2)**

The purpose of this notice is to amend Standard No. 206, Door Locks and Door Retention Components, to require that all side doors leading into a passenger compartment containing one or more seating accommodations meet the requirements of the standard, regardless of seat location or whether the seats are within the definition of designated seating positions. This notice also amends the standard to make clear the distinction between front and rear doors.

I. A notice of proposed rulemaking proposing the extension of the requirements of the standard to all side doors leading into passenger compartments was published in the Federal Register on February 3, 1971 (36 F.R. 1913). The three comments which were received in response to the notice were carefully considered. All of them supported the proposed amendment. The amendment in this notice is identical to the proposed amendment except for the effective date. That date has been changed to September 1, 1972 to permit adequate time for compliance.

II. The standard specifies in S4.1.3 different door lock requirements for front and rear doors. The Standard does not, however, precisely differentiate between these two types of doors. The problem of determining whether a door is to be treated as a front door or rear door arises particularly in connection with multipurpose passenger vehicles having a single right side door.

To clarify the application of the requirements of S4.1.3, this notice amends the Standard by adding the word "Side" to the titles of S4.1.3.1 and S4.1.3.2 and by adding definitions of "Side front door" and "Side rear door" to S3. The definitions adopt, as the reference point for differentiating between front and rear doors, the

rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position. A door with 50 percent or more of its opening area in a side view forward of that point is a "side front door". A door with more than 50 percent of its opening area in a side view to the rear of that point is a "side rear door".

These amendments to Standard No. 206 are clarifying and interpretive in nature. Consequently, it is found that notice and opportunity to comment are unnecessary and that, for good cause shown, an effective date earlier than 30 days after issuance is in the public interest.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 206, § 571.206 of title 49, Code of Federal Regulations, is amended....

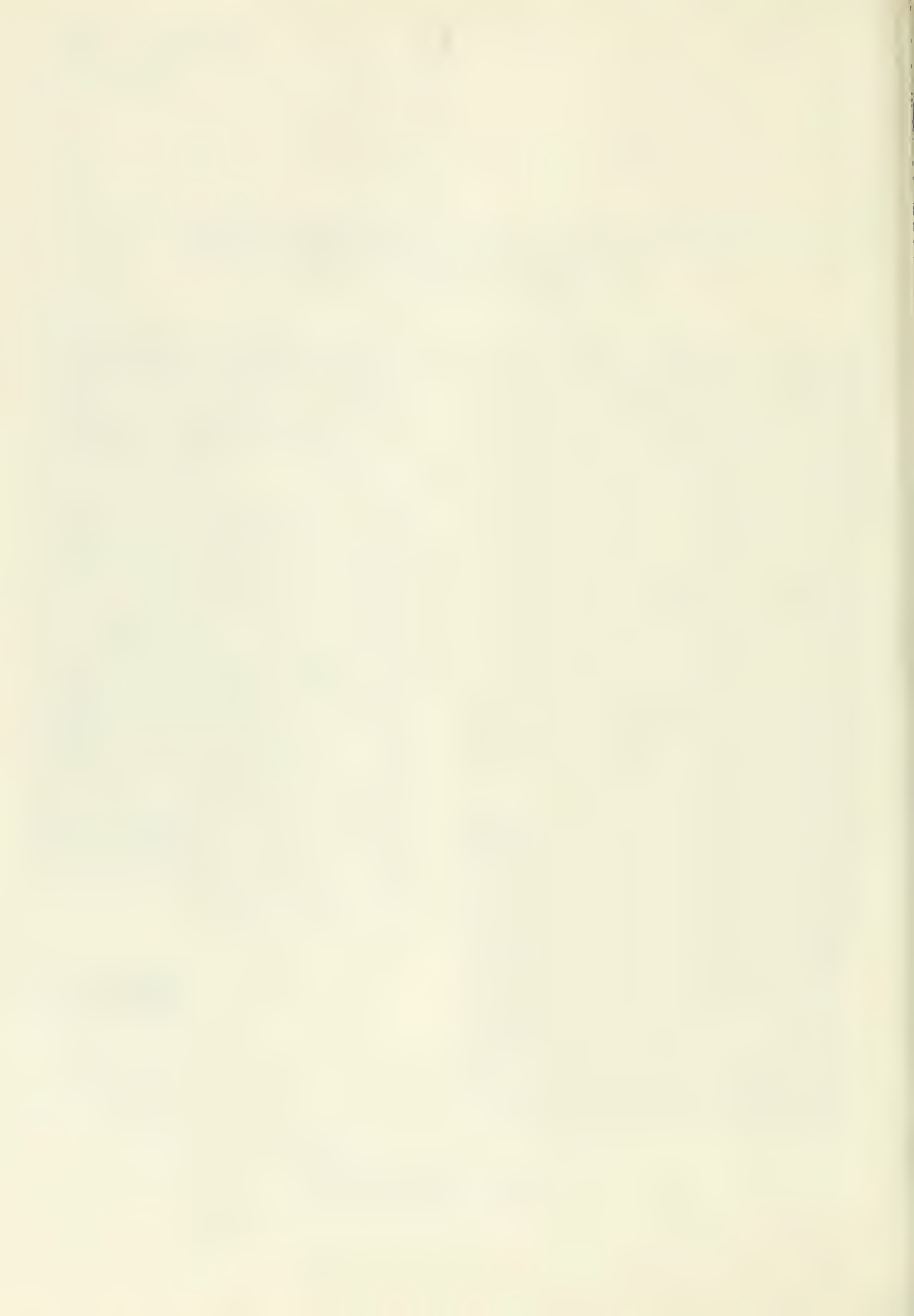
Effective dates: Amendment 1. concerning the application of the standard is effective September 1, 1972. Amendment 2. through 4. concerning the distinction between front and rear doors are effective January 8, 1972.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on January 4, 1972.

Douglas W. Toms  
Administrator

37 F.R. 284  
January 8, 1972



## MOTOR VEHICLE SAFETY STANDARD NO. 206

### Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles, and Trucks

**S1. Purpose and scope.** This standard specifies requirements for side door locks and side door retention components including latches, hinges, and other supporting means, to minimize the likelihood of occupants being thrown from the vehicle as a result of impact.

**S2. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, and trucks.

**S3. Definitions.** “Cargo-Type Door” means a door designed primarily to accommodate cargo loading including, but not limited to, a two-part door that latches to itself.

“Side front door” means a door that in a side view, has 50 percent or more of its opening area forward of the rearmost point on the driver’s seatback, when the driver’s seat is adjusted to its most vertical and rearward position.

“Side rear door” means a door that, in a side view, has more than 50 percent of its opening area to the rear of the rearmost point on the driver’s seatback, when the driver’s seat is adjusted to its most vertical and rearward position.

**S4. Requirements.** Components on any side door leading directly into a compartment that contains one or more seating accommodations shall conform to this standard. However, components on folding doors, roll-up doors and doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors need not conform to this standard.

#### **S4.1 Hinged Doors, Except Cargo-Type Doors.**

**S4.1.1 Door Latches.** Each door latch and striker assembly shall be provided with two positions consisting of—

- (a) A fully latched position; and
- (b) A secondary latched position.

**S4.1.1.1 Longitudinal Load.** The door latch and striker assembly, when in the fully latched position, shall not separate when a longitudinal load of 2,500 pounds is applied. When in the secondary latched position, the door latch and striker assembly shall not separate when a longitudinal load of 1,000 pounds is applied.

**S4.1.1.2 Transverse Load.** The door latch and striker assembly, when in the fully latched position, shall not separate when a transverse load of 2,000 pounds is applied. When in the secondary latched position, the door latch and striker assembly shall not separate when a transverse load of 1,000 pounds is applied.

**S4.1.1.3 Inertia Load.** The door latch shall not disengage from the fully latched position when a longitudinal or transverse inertia load of 30g is applied to the door latch system (including the latch and its actuating mechanism with the locking mechanism disengaged).

**S4.1.2 Door Hinges.** Each door hinge system shall support the door and shall not separate when a longitudinal load of 2,500 pounds is applied. Similarly, each door hinge system shall not separate when a transverse load of 2,000 pounds is applied.

**S4.1.3 Door Locks.** Each door shall be equipped with a locking mechanism with an operating means in the interior of the vehicle.



**S4.1.3.1 Side Front Door Locks.** When the locking mechanism is engaged, the outside door handle or other outside latch release control shall be inoperative.

**S4.1.3.2 Side Rear Door Locks.** In passenger cars and multipurpose passenger vehicles, when the locking mechanism is engaged, both the outside and inside door handles or other latch release controls shall be inoperative.

## **S4.2 Hinged Cargo-Type Doors.**

### **S4.2.1 Door Latches.**

**S4.2.1.1 Longitudinal Load.** Each latch system, when in the latched position, shall not separate when a longitudinal load of 2,500 pounds is applied.

**S4.2.1.2 Transverse Load.** Each latch system, when in the latched position, shall not separate when a transverse load of 2,000 pounds is applied. When more than one latch system is used on a single door, the load requirement may be divided among the total number of latch systems.

**S4.2.2 Door Hinges.** Each door hinge system shall support the door and shall not separate when a longitudinal load of 2,500 pounds is applied, and when a transverse load of 2,000 pounds is applied.

**S4.3 Sliding Doors.** The track and slide combination or other supporting means for each sliding door shall not separate when a total transverse load of 4,000 pounds is applied, with the door in the closed position.

## **S5. Demonstration Procedures.**

### **S5.1 Hinged Doors, Except Cargo-Type Doors.**

#### **S5.1.1 Door Latches.**

**S5.1.1.1 Longitudinal and Transverse Loads.** Compliance with paragraphs S4.1.1.1 and S4.1.1.2 shall be demonstrated in accordance with paragraph 4 of Society of Automotive Engineers

Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965.

**S5.1.1.2 Inertia Load.** Compliance with S4.1.1.3 shall be demonstrated by approved tests or in accordance with paragraph 5 of SAE Recommended Practice J839b, May 1965.

**S5.1.2 Door Hinges.** Compliance with S4.1.2 shall be demonstrated in accordance with paragraph 4 of SAE Recommended Practice J934, "Vehicle Passenger Door Hinge Systems," July 1965. For piano-type hinges, the hinge spacing requirements of SAE J934 shall not be applicable and arrangement of the test fixture shall be altered as required so that the test load will be applied to the complete hinge.

## **S5.2 Hinged Cargo-Type Doors.**

**S5.2.1 Door Latches.** Compliance with S4.2.1 shall be demonstrated in accordance with paragraphs 4.1 and 4.3 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965. An equivalent static test fixture may be substituted for that shown in Figure 2 of SAE J839, if required.

**S5.2.2 Door Hinges.** Compliance with S4.2.2 shall be demonstrated in accordance with paragraph 4 of SAE Recommended Practice J934, "Vehicle Passenger Door Hinge Systems," July 1965. For piano-type hinges, the hinge spacing requirement of SAE J934 shall not be applicable and arrangement of the test fixture shall be altered as required so that the test load will be applied to the complete hinge.

**S5.3 Sliding Doors.** Compliance with S4.3 shall be demonstrated by applying an outward transverse load of 2,000 pounds to the load bearing members at the opposite edges of the door (4,000 pounds total). The demonstration may be performed either in the vehicle or with the door retention components in a bench test fixture.

**34 F.R. 1150**

**January 24, 1969**

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD 207

### Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses (Docket No. 2-12; Notice No. 3)

The purpose of this amendment to Motor Vehicle Safety Standard No. 207 is to extend its application to multipurpose passenger vehicles, trucks and buses, to require a seat to remain in its adjusted position during load application, and to clarify and restructure the standard.

A notice of proposed rulemaking on the subject of amending Motor Vehicle Safety Standard No. 207, and extending it to multipurpose passenger vehicles, trucks and buses was published on September 20, 1969 (34 F.R. 14661).

The need for adequately anchored seating is clear. A seat that tears loose on impact adds to the hazards that are inherent in crash situations. Each seat must remain in place if it is to afford any protection to its occupant. Standard No. 207 accordingly established strength requirements for the anchorage of occupant seats, required that a means be provided for keeping folding seats and seat backs in place, and prescribed strength requirements for seat backs and seat back restraints. The proposal to extend the standard's application to additional types of vehicles is part of an overall effort to afford occupants of these vehicles protection equal to that now available to occupants of passenger cars. The extension of Standard No. 207 is closely allied with the extension of standards for seat belt installation (208) and anchorages (210) to these other vehicle types.

Most of the comments favored the extended application of the standard. Some persons who objected voiced the fear that the seat system requirements would eliminate some seating configurations in multipurpose passenger vehicles and walk-in van-type trucks. Although manufacturers of these vehicles may have to make

design changes, it has been determined that strength and convenience in this case are not incompatible, and that the provision of adequate seats is not impracticable for such vehicles. It should also be noted that if a seat is not intended for use while the vehicle is in motion, and therefore provides no designated seating position under the amended definition of that term in section 571.3 of Title 49 CFR, the requirements of this standard do not apply to it.

Several respondents observed that the requirements of S4.2 that a seat sustain the required force "in each position to which it can be adjusted" would impose a substantial burden on power seats, whose "positions" may be very numerous. The intent of the paragraph is to insure that a seat would be able to sustain the specified force in any position that is usable in actual operations, although the manufacturer may choose to test it only in its most vulnerable positions. Thus, the manufacturer may use whatever means are at his disposal to meet the minimum requirements; the standards are not intended to dictate either the nature or the quantity of manufacturer testing. The requirement has been reworded slightly and language has been added to make it clear that the force specified by subparagraph (d) is applied to the seat only in the rearmost position.

The requirement that the seat withstand the load without leaving its adjusted position has been retained, but in response to another group of comments it has been decided to allow non-locking suspension type seats to travel normally during application of the loads required by S4.2. Any other method of testing would not accurately reflect the actual performance characteristics of such seats.

Several comments questioned the utility of requiring a seat back restraint release to be readily accessible if its use is not required for normal exit from the vehicles. There appears to be merit to this argument with respect to the need for rear seat occupants to use the release and the paragraph has been altered accordingly.

One comment stated that subparagraph S4.3.2.1 of the proposal should be amended to require the restraint on a rearward-facing seat to withstand a rearward load equal to eight times the weight of the pivoting or folding portion of the seat. This suggestion has merit, and the subparagraph has been amended by the addition of a new subparagraph dealing expressly with rearward-facing seats.

Several comments requested that addition of language permitting "approved physical demonstrations" or "approved dynamic tests" in place of the static loading requirements in S4.2 and S4.3. For several reasons, that language has not been added to the amended Standard No. 207. The Bureau adheres to the procedures specified in the standard in its own testing, and it is therefore essential that the procedures be set forth with precision. However, if a manufacturer develops test procedures which are equal to those in the standard, in the sense that the results can

be accurately correlated with the standard's requirements, nothing in the Act or in the standard prevents him from using his tests to determine that his product conforms to the standard. The Bureau wishes to encourage new developments in the field of testing, and does not intend that the amended standard should inhibit them.

The proposal has been further changed by incorporating the substance of the test procedures in SAE J879b into the text of the standard and by adopting the accompanying drawings as figures 1-5 of the standard.

Effective date: January 1, 1972.

Several comments indicated that the proposed effective date of January 1, 1971, would leave many manufacturers unable to comply, particularly with respect to multipurpose passenger vehicles and trucks. Therefore, it has been determined that there is good cause for specifying an effective date more than 1 year after the date of publication.

Issued on September 23, 1970.

Charles H. Hartman,  
Acting Director.

35 F.R. 15290  
October 1, 1970



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 207

### Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses (Docket No. 2-12; Notice No. 4)

An amendment to Motor Vehicle Safety Standard No. 207, Seating Systems, was published on October 1, 1970 (35 F.R. 15290). Thereafter, pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119), petitions for reconsideration were filed by the Ford Motor Company and Rolls Royce, Ltd.

The petition of Rolls Royce, Ltd., sought to amend § S4.2.1, *Seat adjustment*, to permit a displacement of 2 inches during the application of the required force. The company stated that such an allowance was necessary to accommodate power seats that are continuously adjustable. Although the Administration has determined that it is not advisable to permit a specific displacement, the special circumstances of the power seat warrant a more explicit interpretation of the term "adjusted position" as employed in the standard.

Some types of manual adjustment device have a small amount of slack, that is detected during the test procedure but is not an indication of incipient failure and is therefore not considered to affect the conformity of the system. In reviewing the characteristics of power adjustment devices, the Administration has concluded that some similar amount of slack may exist in such systems and that it should not be the basis for a finding of non-conformity. The Administration will consider a continuously adjustable power seat to have remained in its adjusted position despite some movement, if the movement is small and if it has stopped as the maximum required force level is reached.

The substance of the Ford petition was that the requirement for the seat back release control to be accessible to an occupant of the seat is not appropriate if the occupant does not need to use it to exit from the vehicle. This point was illustrated by the case of a seat in a truck cab that folds for access to a storage compartment. The Administration has determined that the situation used by Ford to illustrate its case is a situation in which relief from the requirement should be granted, but that where there is a seating position behind the folding seat the release control should continue to be accessible to the occupant of the folding seat. This requirement has been a part of the standard from the outset, and by making the latch more easily usable makes it less likely to be intentionally defeated.

Ford also indicated that it understood the standard to require that the seat be releasable from each seating position on the seat. This is not a correct reading of the standard. The Administration's interpretation continues to be that the release control must be accessible to at least one occupant of each folding part of a seat.

In consideration of the foregoing, section S4.3.1, *Accessibility of release control*, in Standard No. 207, 49 CFR 571.21, is amended. . . .

Effective date: January 1, 1972.

Issued on April 14, 1971.

Douglas W. Toms,  
Acting Administrator.

36 F.R. 7419  
April 20, 1971



## MOTOR VEHICLE SAFETY STANDARD NO. 207

### Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 2-12; Notice No. 3)

**S1. Purpose and scope.** This standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibility of their failure by forces acting on them as a result of vehicle impact.

**S2. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses.

**S3. Definition.** "Occupant seat" means a seat that provides at least one designated seating position.

#### **S4. Requirements.**

**S4.1 Driver seat.** Each vehicle shall have an occupant seat for the driver.

**S4.2 General performance requirements.** When tested in accordance with S5, each occupant seat, other than a side-facing seat or a passenger seat on a bus, shall withstand the following forces:

(a) In any position to which it can be adjusted—20 times the weight of the seat applied in a forward longitudinal direction;

(b) In any position to which it can be adjusted—20 times the weight of the seat applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat—the force specified in subparagraph (a), if it is a forward facing seat, or subparagraph (b), if it is a rearward facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with section S4.2 of Federal Motor Vehicle Safety Standard No. 210; and

(d) In its rearmost position—a force that produces a 3,300 inch-pound moment about the seating reference point for each designated seating position that the seat provides, applied to the upper cross-member of the seat back or the

upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

**S4.2.1 Seat adjustment.** Except for vertical movement of nonlocking suspension type occupant seats in trucks or buses, the seat shall remain in its adjusted position during the application of each force specified in S4.2.

**S4.3 Restraining device for hinged or folding seats or seat backs.** Except for a passenger seat in a bus or a seat having a back that is adjustable only for the comfort of its occupants, a hinged or folding occupant seat or occupant seat back shall be equipped with a self-locking device for restraining the hinged or folding seat or seat back and a control for releasing that restraining device.

**S4.3.1 Accessibility of release control.** If there is a designated seating position immediately behind a seat equipped with a restraining device, the control for releasing the device shall be readily accessible to the occupant of the seat equipped with the device and, if access to the control is required in order to exit from the vehicle, to the occupant of the designated seating position immediately behind the seat.

#### **S4.3.2 Performance of restraining device.**

##### **S4.3.2.1 Static force.**

(a) Once engaged, the restraining device for forward-facing seat shall not release or fail when a forward longitudinal force equal to 20 times the weight of the hinged or folding portion of the seat is applied through the center of gravity of that portion of the seat.

(b) Once engaged, the restraining device for a rearward facing seat shall not release or fail



when a rearward longitudinal force equal to 8 times the weight of the hinged or folding portion of the seat is applied to the center of gravity of that portion of the seat.

**S4.3.2.2 Acceleration.** Once engaged, the restraining device shall not release or fail when the device is subjected to an acceleration of 20 g. in the longitudinal direction opposite to that in which the seat folds.

**S4.4 Labeling.** Seats not designated for occupancy while the vehicle is in motion shall be conspicuously labeled to that effect.

## S5. Test procedures.

**S5.1** Apply the forces specified in S4.2(a) and S4.2(b) as follows:

**S5.1.1** If the seat back and the seat bench are attached to the vehicle by the same attachments, secure a strut on each side of the seat from a point on the outside of the seat frame in the horizontal plane of the seat's center of gravity to a point on the frame as far forward as possible of the seat anchorages. Between the upper ends of the struts place a rigid cross-member, in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Apply the force specified by S4.2(a) or S4.2(b) horizontally through the rigid cross-member as shown in Figure 1.

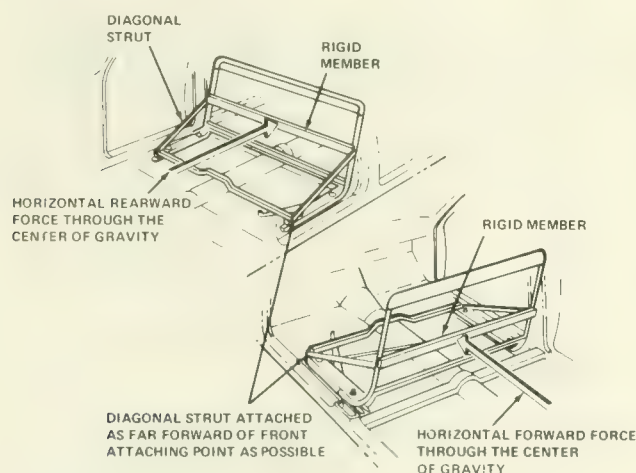


FIGURE 1

**S5.1.2** If the seat back and the seat bench are attached to the vehicle by different attachments, attach to each component a fixture capable of transmitting a force to that component. Apply

forces equal to 20 times the weight of the seat back horizontally through the center of gravity of the seat back, as shown in Figure 2, and apply forces equal to 20 times the weight of the seat

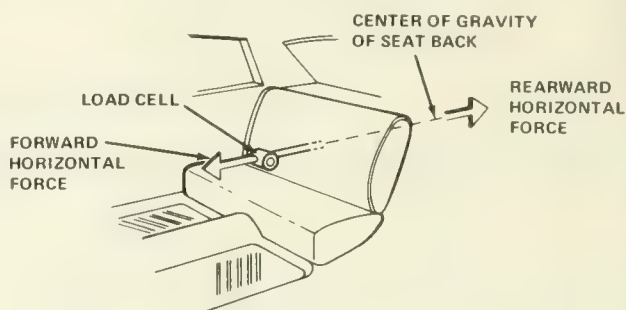


FIGURE 2

bench horizontally through the center of gravity of the seat bench, as shown in Figure 3.

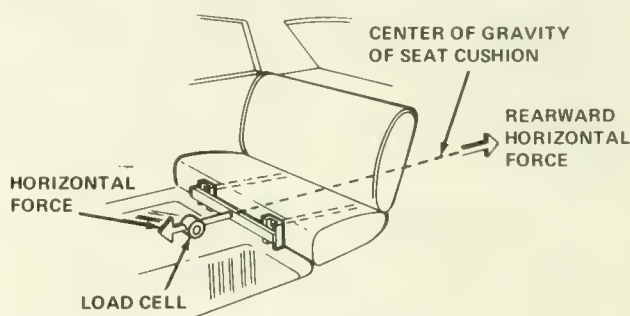


FIGURE 3

**S5.2** Develop the moment specified in S4.2(d) as shown in Figure 4.

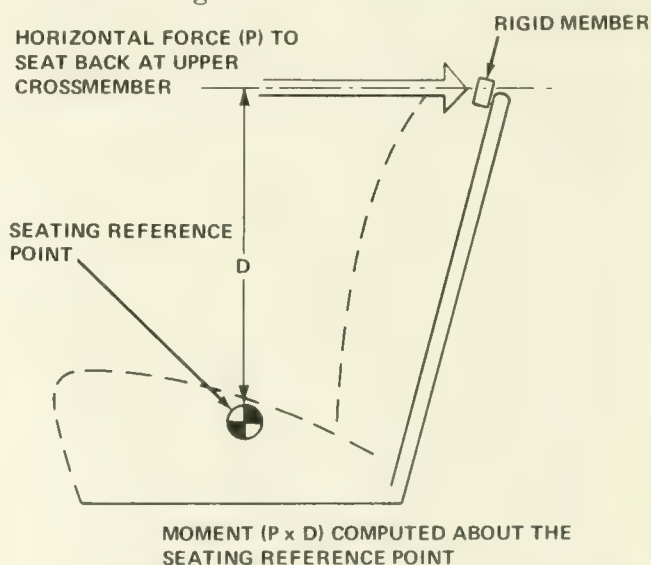


FIGURE 4

**S5.3** Apply the forces specified in S4.3.2.1 (a) and (b) to a hinged or folding seat as shown in figure 1 and to a hinged or folding seat back as shown in Figure 5.

**S5.4** Determine the center of gravity of a seat or seat component with all cushions and upholstery in place and with the head restraint in its fully extended design position.

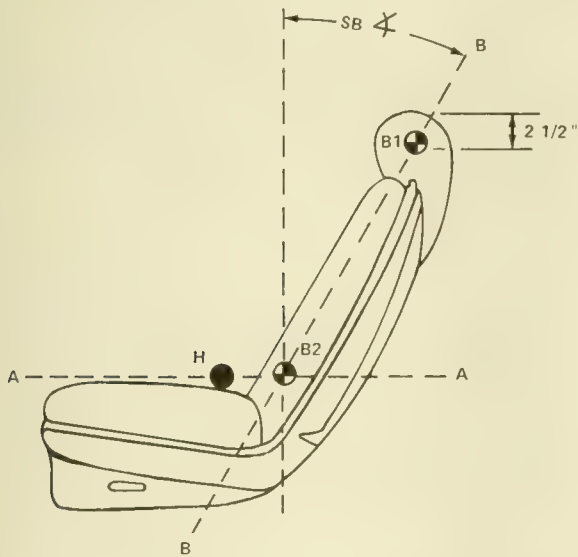


FIGURE 5

35 F.R. 15290  
October 1, 1970





## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208**

### **Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses**

**(Docket No. 69-7; Notice No. 9)**

The purpose of this amendment to Standard No. 208, 49 CFR 571.21, is to specify occupant crash protection requirements for passenger cars, multipurpose passenger vehicles, trucks, and buses manufactured on or after January 1, 1972, with additional requirements coming into effect for certain of those vehicles on August 15, 1973, August 15, 1975, and August 15, 1977. The requirements effective for the period beginning on January 1, 1972, were the subject of a notice of proposed rulemaking published September 25, 1970 (35 F.R. 14941), and appear today for the first time in the form of a rule. The requirements for subsequent periods were issued in rule form on November 3, 1970 (35 F.R. 16927), and are reissued today in amended form as the result of petitions for reconsideration.

The substantive rulemaking actions that preceded this amendment are as follows:

(a) May 7, 1970 (35 F.R. 7187)—Proposed requirements and a schedule for the adoption of passive restraint systems and interim active systems.

(b) September 25, 1970 (35 F.R. 14941)—Proposal for a modified interim set of requirements effective January 1, 1972.

(c) November 3, 1970 (35 F.R. 16927)—Rule amending Standard No. 208 to specify requirements for passive restraints, effective July 1, 1973.

(d) November 3, 1970 (35 F.R. 16937)—Proposed additional requirements and conditions to be contained in Standard No. 208.

Following issuance of the November 3 amendment, petitions for reconsideration were filed pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119) by Japan Automobile

Manufacturers Association, Inc., American Safety Belt Council, Peugeot, Inc., American Motors Corp., Volvo, Inc., Ford Motor Co., Chrysler, Chrysler United Kingdom, Ltd., International Harvester Co., Automobile Manufacturers Association, General Motors Corp., Volkswagen of America, Inc., Takata Kojyo Co., Ltd., Renault, Inc., American Motors (Jeep), Rolls-Royce, Ltd., American Safety Equipment Corp., Hamill Manufacturing Co., Energy Systems Division (Olin), American Association for Automotive Medicine, Checker Motors Corp., Eaton Yale and Towne, Inc., and the American Academy of Pediatrics.

Concurrently with the evaluation of the petitions, the Administration has reviewed the comments received in response to the September 25 and November 3 proposals, and the interim occupant protection requirements are combined herein with the requirements for later periods.

The standard establishes quantitative criteria for occupant injury, as determined by use of anthropomorphic test devices. For the head, the criterion is a severity index of 1,000, calculated according to SAE Information Report J885a; for the upper thorax, it is a deceleration of 60g except for a cumulative period of not more than 3 milliseconds; and for the upper legs it is an axial force of 1,400 pounds. A fourth criterion is that the test devices must be contained by the outer surfaces of the passenger compartment.

For systems that provide complete passive protection there are three vehicle impact modes in which a vehicle is required to meet the injury criteria. In the frontal mode, the vehicle impacts a fixed collision barrier perpendicularly or at any angle up to and including 30° in either

direction from the perpendicular while traveling longitudinally forward at any speed up to 30 m.p.h. In the lateral mode, the vehicle is impacted on its side by a barrier moving at 20 m.p.h. In the rollover mode, the vehicle is rolled over from a speed of 30 m.p.h.

On January 1, 1972, a passenger car will be required to provide one of three options for occupant protection: (1) Passive protection system that meets the above injury criteria in all impact modes at all seating positions; (2) lap belts at all positions, with a requirement that the front outboard positions meet the injury criteria with lap-belted dummies in a 30-m.p.h. perpendicular barrier crash; or (3) lap-and-shoulder-belt systems at the front outboard positions that restrain test dummies in a 30-m.p.h. barrier crash without belt or anchorage failure, and lap belts in other positions.

Both the second and third options require warning systems that activate a visible and audible signal if an occupant of either front outboard position has not extended his lap belt to a specified length. Lap belts furnished under the second or third options must have emergency-locking or automatic-locking retractors at all outboard positions, front and rear. Shoulder belts furnished under the third option must have either manual adjustment or emergency-locking retractors.

On August 15, 1973, a passenger car will be required to provide one of two options for occupant protection: (1) Passive protection that meets the injury criteria in all impact modes at all seating positions; or (2) a system that provides passive protection for the front positions in a perpendicular frontal fixed barrier crash, that includes lap belts at all seating positions such that the injury criteria are met at the front positions both with and without lap belts fastened in a perpendicular frontal fixed barrier crash, and that has a seat belt warning system at the front outboard positions.

On and after August 15, 1975, a passenger car will be required to meet the injury criteria in all impact modes at all seating positions by passive means.

Multipurpose passenger vehicles and trucks with gross vehicle weight ratings of 10,000 pounds or less manufactured from January 1,

1972, to August 15, 1975, will have the option of meeting the injury criteria in all impact modes at all seating positions by passive means, or of providing a seatbelt assembly at each designated seating position. From August 15, 1975, to August 15, 1977, these vehicles will be required to meet one of the two options permitted passenger cars during the period August 15, 1973, to August 15, 1975. On and after August 15, 1977, they will be required to meet the full passive crash protection requirements that become effective for passenger cars on August 15, 1975. Forward control vehicles, however, may continue to use belt systems, and certain other specialized types of vehicles may continue to provide only head-on passive protection.

Multipurpose passenger vehicles and trucks with a GVWR of more than 10,000 pounds manufactured on or after January 1, 1972, will have the option of providing protection by passive means that meet all the crash protection requirements or of installing seat belt assemblies at all seating positions. Buses manufactured after January 1, 1972, will be required to provide one of these options for the driver's seating position.

The remainder of this preamble is separated into sections dealing with (I) the comments received in response to the September 25 proposal for the interim system, (II) the petitions for reconsideration of the November 3 rule on the requirements for later periods, and (III) the comments received and action taken pursuant to the November 3 proposal for additional requirements.

I. The September 25 proposal specified a series of options for occupant protection in passenger cars manufactured on or after January 1, 1972. Each option represented a significant advance over the level of protection afforded occupants by present seat belt systems. Upon consideration of comments requesting postponement of the requirements, it has been determined that compliance with one or another of the options by January 1, 1972, is reasonable and practicable. In response to the comments and other available information, however, certain changes have been made.

In the proposal, the first option consisted of a passive protection system that would meet the



injury criteria at all seating positions in a 30 m.p.h. perpendicular frontal impact. A large number of respondents (to this notice and to others dealt with herein), both within and outside of the concerned industries, took the position that the requirements for installation of seat belts should not be dropped until the vehicles in question provided protection in angular, lateral, and rollover crash modes, in addition to the direct frontal mode. After detailed consideration of these arguments and other available data, it has been determined that the added cost of seatbelt systems is justified, even where vehicles provide passive frontal-impact protection. Accordingly, the first option, the only one under which manufacturers are allowed not to provide seat belts in their vehicles, requires a passive protection system that meets the injury criteria in all of the impact modes mentioned above.

The second option set forth in the proposal consisted of Type 1 seatbelt assemblies with a warning system at the front outboard positions and Type 1 or Type 2 assemblies at the other positions. The front outboard positions were either to meet the injury criteria in a perpendicular impact by use of the belts, or be protected by energy absorbing materials conforming to amended requirements proposed for Standards No. 201 and 203. The latter alternative was the subject of several adverse comments, and in the light of these comments and the tentative nature of the proposed amendments to Standards No. 201 and 203, the alternative has been deleted. As adopted, the option provides that the front outboard positions must meet the injury criteria in a perpendicular fixed barrier crash with the test dummies restrained by Type 1 belts only. The wording that a vehicle should have "either a Type 1 or a Type 2" seatbelt assembly under this option has been changed to refer simply to Type 1 (lap belt) assemblies. A manufacturer may at his option provide upper torso restraints, which do or do not attach to the lap belts. The essence of the second option, however, is that the vehicle be designed to provide protection with lap belts alone, in view of their much higher level of public use in comparison with lap-and-shoulder combinations. Vehicles under this option, therefore, must provide lap belts that are usable separately.

The third option proposed in the September 25 notice has been adopted with some changes. It consists of an improved combination of lap and shoulder belts in the front outboard seating positions, with lap belts in other positions. The belts and anchorages at the front outboard positions must be capable of restraining a dummy in a 30-m.p.h. frontal perpendicular impact without separation of the belts or their anchorages.

The seatbelt warning system required under the second and third options has been modified somewhat in the light of the comments, to clarify the requirements and to restrict its operation to situations where the vehicle is likely to be in motion. The notice proposed that the system operate when the driver or right front passenger, or both, occupied the seat but did not fasten the belt about them. It was stated in several comments such systems operating through the buckle are relatively complex and that leadtime would be a significant problem. Upon evaluation of the comments, it has been decided to provide for warning system operation when the driver's belt is not extended to a length that will accommodate a 5th-percentile adult female, or when the right front passenger's seat is occupied and that belt is not extended far enough to fit a 50th-percentile 6-year-old. Keying the system to belt withdrawal is technologically simpler, and still provides protection against tampering. The notice had proposed that the system operate whenever the vehicle's ignition was in the "on" position. It was pointed out in the comments that situations arise in which the vehicle is at rest with the ignition on and the engine running, as when picking up or discharging passengers. To avoid the annoyance to vehicle occupants of the warning system in such situations, the standard provides that the system shall operate only if the ignition is in the "on" position and the transmission is in a drive position.

The seat belt system requirements have also been changed somewhat in response to comments. The notice had proposed to require retractors at all seating positions in those options specifying seat belts. Several comments stated that the installation of retractors at inboard positions would require extensive redesign of bench-type seats. In the light of the low occupancy rate for the center seats, the difficulties in meet-



ing the requirement, and the short leadtime available, the requirement for center-position retractors has been omitted.

The requirement that the shoulder and pelvic restraints be releasable at a single point by a pushbutton-type action has been retained. The Administration considers that single-point release is essential to the convenient operation of the seat belts, and that standardization of the buckle release device is also important, particularly in emergency situations. However, the additional requirement for one-hand fastening by the driver has been deleted. Adjustable bench seats would require major redesign in many cases, and it has been determined that the additional convenience afforded the driver would not be sufficient to justify the cost and leadtime problems that would result.

A number of comments noted that no dimensions were specified in the notice for the various occupants, and that there were no dimensions of this type in general use. To remedy the problem, the standard provides a table of dimensions for various sizes of adult occupants and 50th-percentile 6-year-olds. The latter set of dimensions has been adopted because of the availability of manikins at that size.

In response to several comments stating that the proposed 8-inch distance between the occupant's centerline and the intersection of the upper torso belt with the lap belt was too great, the distance has been reduced to 6 inches. It has been determined that a 6-inch distance will provide satisfactory protection and lessen the convenience problems that might be created with the greater distance.

II. With few exceptions, the petitions for reconsideration of the November 3 amendment requested that the requirement for mandatory passive protection be postponed. The length of postponement requested varied from 2 months to several years. After full consideration of the issues raised by the petitions, it has been decided to continue to require passive protection for the front seating positions of passenger cars in 1973. In order to ease the problem of model year scheduling, the date is changed from July 1, 1973, to August 15, 1973. The petitions did not offer sufficient reasons to change the Administration's position as set forth in previous notices in

this docket, that passive protection systems are a vitally important step in reducing the death and injury toll on our highways, and that the relevant technology is sufficiently advanced to provide this basic protection, in accordance with the performance requirements and the time schedule that have been specified. The petitions that requested a postponement of all passive protection requirements beyond August 15, 1973, are therefore denied.

However, considerable data was presented in the petitions to the effect that the development of passive systems for the various impact modes has not proceeded at an equal rate. It appears that a number of manufacturers may be unable to comply with the lateral crash protection requirements in 1973. Accordingly, it has been decided to establish two restraint options for the front seating positions of passenger cars manufactured on or after August 15, 1973, and before August 15, 1975. A manufacturer may choose, first, to provide a passive system that meets the occupant crash protection requirements at all seating positions, in all impact modes. If he is unable to provide such full passive protection, he may choose to adopt a system that provides passive protection for the front occupants in a head-on collision, and also, includes a lap belt at each seating position with a seatbelt warning system for the front outboard positions. Under this option, the injury criteria must be met at each front position in a perpendicular barrier crash up to 30 m.p.h., both with and without the lap belts fastened. This option thus resembles the second option permitted during the interim period, except that the injury criteria must also be met with the test dummies unrestrained, and at the front center position as well as the front outboard positions.

The date on which a passenger car must provide passive means of meeting the injury criteria in a side impact is changed to August 15, 1975, to reflect the greater leadtime needed to develop such passive systems. To provide uniform phasing, and allow time for development of passive protection in the angular-impact and roll-over modes, the effective date for these requirements is also set at August 15, 1975. Thus, after August 15, 1975, each passenger car must meet the crash protection requirements at each seating

position in all impact modes by means that require no action by vehicle occupants.

Petitions of manufacturers of multipurpose passenger vehicles and trucks with GVWR of 10,000 pounds or less stated that the trucking industry as a whole would need additional time to assimilate the experience of passenger car manufacturers, before passive systems could be properly installed on their vehicles. The Administration has determined that additional leadtime is required for these vehicles. The standard accordingly provides that the protection required for passenger cars in 1973 will be required for multipurpose passenger vehicles and trucks with a GVWR of 10,000 pounds or less on August 15, 1975. The protection required for passenger cars on August 15, 1975, will be required of these vehicles on August 15, 1977.

The notice of proposed rulemaking published on November 3, 1970, proposed to make the passive protection requirements applicable to open-body type vehicles. Review of the comments and the petitions for reconsideration leads to the conclusion that this type of vehicle, along with convertibles, walk-in van-type vehicles, motor homes, and chassis-mount campers cannot be satisfactorily equipped with a complete passive protection system. Accordingly, the standard provides that only the head-on passive protection system required for passenger cars in 1973 will be required for each of these types on August 15, 1977, and thereafter. It has been further determined that it may not be feasible to provide passive protection in some forward control vehicles, and such vehicles are therefore permitted the option of providing seat belt assemblies at all seating positions.

A number of petitions objected to the requirement for a minimum speed below which a crash-deployed system may not deploy. Upon consideration of the petitions, it has been determined that it is preferable to allow manufacturers freedom in the design of their protective systems at all speeds, and this requirement is hereby deleted from the standard.

The injury criteria specified in the November 3 amendment were the subject of numerous petitions. The basic objections to the head injury criteria were that the 70g-3-millisecond requirement was too conservative, with respect to both

acceleration levels and time factors. Review of these objections and a reevaluation of the information available to the Administration leads to the conclusion that the head injury criteria can be more appropriately based on the severity index described in the Society of Automotive Engineers Information Report J885(a), June 1966. Accordingly, the standard adopts as the criterion for head injury a severity index of 1,000 calculated by the method in the SAE report.

The severity index is based on biomechanical data derived from head injury studies and does not adapt itself readily to chest-injury usage. Several petitions stated that the chest injury criteria were set at too low a level. In some respects, a higher "g-level" on the chest actually increases the protective capabilities of the system, if properly designed, since it more effectively utilizes the available space in which the occupant can "ride down" the crash impact—an especially important factor in higher-speed crashes. Therefore, in accordance with data currently available, a chest tolerance level of 60g, except for a cumulative period of 3 milliseconds, is hereby adopted.

No data was received to support the contention of several petitioners that the upper leg load was too conservative. The maximum force level of 1,400 pounds appears well founded and is retained.

Several petitions objected to the condition that vehicles be tested at their gross vehicle weight rating. Under review of the appropriateness of this requirement for passenger cars and a review of loading patterns on trucks, it has been decided to alter the condition to specify that passenger cars are tested at a weight that represents their unloaded vehicle weight (recently defined in the *Federal Register* of Feb. 5, 1971, 36 F.R. 2511) plus the weight of rated cargo capacity and the specified number of test devices. Trucks are to be tested at a weight that approximates a half-loaded vehicle, with the load secured in the cargo area, plus the specified number of test devices.

The use of the anthropomorphic test device described in SAE J963 was objected to by several petitioners, on the grounds that further specifications are needed to ensure repeatability of test results. The Administration finds no sufficient



reason to alter its conclusion that the SAE specification is the best available. The NHTSA is sponsoring further research and examining all available data, however, with a view to issuance of further specifications for these devices.

In response to other comments with respect to test conditions, the test devices' hand positions are adjusted to reduce apparent test variability. Also, the frequency filtration criteria of SAE Recommended Practice J211 have been substituted for the filtration criteria employed in the November 3 notice.

III. The notice of proposed rulemaking issued on November 3, 1970, dealt with several aspects of the occupant protection standard for which changes contemplated by the Administration, after review of the comments to the May 7 notice, were thought to require additional opportunity for comment. These aspects included a proposed deletion of the exemption from the rollover requirements previously proposed for open-body type vehicles, the raising of the low-velocity deployment requirement from 10 to 15 m.p.h., the establishment of requirements for the lateral component of head and chest acceleration, and the amendment of the test conditions for the lateral impact and rollover requirements.

Since the subject of low speed deployment and the question of exemptions were also the subjects of petitions for reconsideration under the November 3 rule, the disposition of these matters has been noted in the preceding section. For the reasons given therein, the low-velocity deployment requirement has been omitted, and the exemptions have been expanded to include forward control vehicles, convertibles, walk-in van-type trucks, motor homes, and chassis-mount campers. These type descriptions are in general use among manufacturers to describe vehicles sharing certain well-defined characteristics. Definitions of these types of vehicles may, as found necessary in the future, be added to § 571.3 *Definitions*.

Upon review of the comments and other information available to the Administration, it has been decided that the establishment of requirements for the lateral component of head and chest acceleration is not feasible at this time. However, it is anticipated that biomechanical studies will shortly provide data regarding

lateral tolerances on which a requirement can be based and that rulemaking action will thereupon resume.

The conditions proposed for the lateral impact and rollover tests have been adopted as proposed without significant change. Comments on the lateral impact test revealed no significant support for a fixed barrier collision of the type proposed in the May 7 notice, although several recommended use of the moving barrier specified in SAE Recommended Practice J972 and others requested that the height of the barrier be lowered from 65 inches to 36-38 inches as specified in SAE J972. The decision to retain the test and barrier dimensions as proposed in the November 3 notice was made after a full review of the SAE procedures.

The test as adopted is considered to afford greater repeatability than the SAE procedure, which permits a much more complex interaction between the barrier and the impacted vehicle. The height of the barrier has been retained at 65 inches so that it will test the head impact protection afforded by the vehicle when struck by a surface extending to head height. Passenger compartment intrusion of the type that might result from use of a lower barrier is the subject of a separate rulemaking action on side door strength.

Some comments suggested that the wording of the proposed procedures, that the moving barrier undergo no deformation or nonlongitudinal movement, was unduly restrictive. The wording is not, however, intended to describe an actual test, but to establish the condition that the vehicle must be capable of meeting the stated requirements no matter how small the degree of deformation or nonlongitudinal movement of the barrier. This issue, in the case of the moving barrier, is thus analogous to that in the definition of "fixed collision barrier" (35 F.R. 11242, July 14, 1970). To more clearly reflect this position and the legal similarity of the two types of barriers, the word "significant" is added to the conditions relating to movement and deformation of the barrier.

Several comments stated that the rollover test would not produce repeatable results. Although refinements may be made in the procedure before the date on which rollover protection becomes



mandatory, the Administration has determined that the test as adopted is more satisfactory than any other suggested thus far. The kinematics of a rollover type accident are such that variability in vehicle behavior may often be more visible than in other test procedures.

A number of other minor issues were raised by the petitions, and each has been carefully evaluated by the Administration. With respect to those objections and suggestions not specifically mentioned elsewhere in this notice, the petitions are hereby denied.

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In light of the foregoing, Motor Vehicle Safety Standard No. 208 in § 571.21 of Title 49, Code of Federal Regulations, is amended . . . with effective dates as specified in the text of the standard.

Issued on March 3, 1971.

Douglas W. Toms,  
Acting Administrator.

**36 F.R. 4600**  
**March 10, 1971**



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208**

## **Occupant Crash Protection**

**(Docket No. 69-7; Notice 10)**

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, in § 571.21 of Title 49, Code of Federal Regulations. The petitions addressed herein are those dealing with seat belts and seat belt warning systems. A notice responding to petitions concerning the passive protection aspects of the standard will be issued shortly and the standard republished in its entirety at that time.

The standard as issued March 3, 1971 (36 F.R. 4600), established January 1, 1972, as the first date in the progressive stages of the Occupant Crash Protection requirements. Two petitioners, Mercedes-Benz and American Motors, requested a delay in the introduction of the interim protection systems. American Motors requested a delay until April 1, 1972, to allow for adequate compliance testing, and Mercedes requested a date of July 1, 1972, to avoid disruption of the 1972 model production which begins on July 1, 1971. Upon review of all available information, the NHTSA has concluded that the date is not unreasonably demanding, and the requests are denied.

The improved seat belt systems required in passenger cars that do not provide full passive protection were the subject of several petitions. Primary attention was directed to the belt warning system and the conditions under which it must operate. As issued on March 3, the standard provides that the system shall operate when and only when the ignition is on, the transmission is in any forward or reverse position, and either the driver's lap belt is not extended at least to the degree necessary to fit a 5th-percentile adult female or a person of at least the weight of a 50th-percentile 6-year old is seated

in the right front position and the belt is not extended to the length necessary to fit him.

The intent of the transmission position requirement was to require operation of the warning system when the vehicle was likely to be in motion, and the effect of the "when and only when" phrase was to require deactivation in all other positions. Some petitioners argued that rearward motion was not likely to be fast enough to present a hazard. Others stated, on the other hand, that vehicles with automatic transmissions should deactivate the system only in "Park", to encourage drivers to use that position when leaving the vehicle with the engine running. Similarly, it was requested that alternative means of warning system deactivation be permitted on cars with manual transmissions, with one alternative being application of the parking brake. The NHTSA has found these arguments to have merit, and therefore amends S7.3 of the standard in several respects. The amended section requires, as the first condition necessary to activate the warning, that the ignition be "on" and that the transmission be in a forward gear. Actuation is permitted in reverse, but is no longer required. The section is further amended to require that the system on a car with automatic transmissions shall not activate when the transmission is in "park" and that the system on a car with manual transmission shall not activate when the parking brake is on or, alternatively, when the transmission is in neutral.

Several petitions stated that although the length necessary to fit a 50th-percentile 6-year old or a 5th-percentile adult female may be objectively determinable, the sensor in a system may not exactly measure this length due to unavoidable variances in production. To allow for this



variance, a manufacturer must calibrate the retractors so that the range of this variance will be beyond the minimum length, and as a result it is likely that the warning will continue to operate in some situations where a small occupant has properly fastened the belt. A similar objection was raised by Mercedes-Benz and illustrated by the case of a small child whose bouncing could cause the belt to retract far enough to trigger the warning intermittently. These objections are considered to have merit, and the NHTSA has therefore decided to specify a range of extensions below which the system must activate and above which it must not activate. The lower end of the range is an extension of 4 inches from the normally stowed position, and the upper end is the extension necessary to fit a 50th-percentile 6-year-old child when the seat is in the rearmost and lowest position. This range will allow manufacturers a tolerance of several inches in most cases and will enable them to avoid the problems of inadvertent activation.

Mercedes-Benz requested that the warning be deactivated by closing the buckle and stated that this would be simpler and more effective than deactivation by belt extension. Although Mercedes' objections are partially met by the amendments made by this notice to the warning system requirements, a related consequence of the amendments is that the extension needed to close the buckle would fall within the range of discretionary deactivation. There does not appear to be good reason to prohibit deactivation by means of the buckle, and the standard is therefore amended to permit buckle deactivation as an alternative to deactivation by measurement of the belt extension.

General Motors requested a minimum duration for the warning signal beyond which it would not be required to operate. On review, this request appears to satisfy the need for warning and to reduce the annoyance of the signal in situations where unfastening of the belt is necessary. A minimum activation period of one minute is therefore provided.

One other request for amendment of the warning system requirements has been found meritorious. American Motors requested that the

words "Fasten Belts" be permitted as an alternative to "Fasten Seat Belts." The change would not affect the sense of the message, and the request is granted. Requests in other petitions for the use of symbols in place of words, and for a two-stage warning sequence, have been evaluated and rejected.

In its petition, Chrysler requested the adoption of size specifications for the buttocks of a dummy representing a 6-year-old child, on the grounds that currently available dummies do not correspond to human shape and do not activate the Chrysler warning system as a child would. The problem is not considered serious enough to warrant amendment of the standard in the absence of satisfactory data on the shape of 6-year-old children, and the request is denied.

A number of petitions dealt with other aspects of the seat belt options. The requirement for retractors at all outboard seating positions, including the third seats in station wagons, was objected to by Ford and Chrysler because of installation difficulties and the low frequency of seat occupancy. The similarity of these seating positions to the center positions, which are exempt from the reactor requirements, has been found persuasive and retractors are therefore required only for outboard positions on the first and second seats.

Another petition requested that the shoulder belt of Type 2 assemblies should not adjust to fit 50th-percentile 6-year olds, as presently required for passenger seats by S7.1.1. As pointed out in the petition, the previous rule had specified the 5th-percentile adult female as the lower end of the range for shoulder belts. The change effected by the March 3 rule was inadvertent, and the range of occupants is therefore specified as being from the 5th-percentile adult female to the 95th-percentile male.

Correspondence from Toyo Kogyo requesting an interpretation of S7.1.2 has pointed out a need to clarify the requirement that the intersection of an upper torso belt with a lap belt must be six inches from the occupant's centerline. The phrase "adjusted in accordance with the manufacturer's instructions" is intended to refer to adjustment of the upper torso belt, and not to the lap belt which must adjust auto-

matically. The section is amended to clarify this intent.

The second options under the 1972 and 1973 requirements (S4.1.1.2, S4.1.2.2) are amended to expressly permit a Type 2 seat belt assembly with a detachable upper torso restraint at any seating position. A choice of belt systems is permitted under the third option in 1972, and there was no intent under the second options to limit all positions to Type 1 belts.

Several requests and questions were raised regarding the status of "passive" seat belt systems under the standard as issued March 3. Some belt-based concepts have been advanced that appear to be capable of meeting the complete passive protection options and further regulation of their performance does not appear necessary. With respect to the options other than the complete passive protection options, a question has been raised as to whether a passive belt must be used in conjunction with active belt systems or conform to the adjustment, latching, and warning system requirements applicable to active belts. Upon review, the NHTSA has concluded that the passive belt system that is not capable of full protection in all crash modes is in some respects appropriately regulated by seat belt requirements, and is in other respects entitled to treatment as a passive system.

To deal expressly with passive belts, a new general requirements section is added to state the applicability of various requirements to passive belts and to make it clear that redundant active belts need not be employed if passive belts are used to meet any option requiring Type 1 or Type 2 belts.

Many of the requirements applicable to belts have been adopted because of properties that

exist regardless of whether the system is active or passive. The range of the belt's adjustment, the elasticity and width of its webbing, and the integrity of its attachment hardware are all known to affect the protection given. As amended, the standard therefore requires a passive belt to conform to the adjustment requirements of S7.1 and to the webbing, attachment hardware, and assembly performance requirement of Standard No. 209. The petitioners' objections as to the application of the latching requirements to a system that does not require latching and of the warning system requirements to a system that would be functional unless willfully defeated have been found to have merit. A passive belt system is therefore not required to conform to S7.2 and S7.3.

In order to assure that a passive belt or other passive system will not hinder an occupant from leaving the vehicle after a crash, the NHTSA proposes in a separate notice in today's issue of the *Federal Register* (36 F.R. 12866) to require a release for the occupant that either operates automatically in the event of a crash, or operates manually at a single point that is accessible to the seated occupant.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . . Effective date: January 1, 1972.

Issued on July 2, 1971.

Douglas W. Toms  
Acting Administrator

36 F.R. 12858  
July 8, 1971





## Preamble to Amendment to Motor Vehicle Safety Standard No. 208

### Occupant Crash Protection

(Docket No. 69-7; Notice 12)

The purpose of this notice is to respond to petitions filed pursuant to § 553.35 of Title 49, Code of Federal Regulations, requesting reconsideration of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.21, published on March 10, 1971 (36 F.R. 4600).

The petitions covered by this notice deal with the passive restraint requirements, and with the restraint options available after August 15, 1973. Petitions relating to seat belts and seat belt warning systems were answered in a notice published in the *Federal Register* on July 8, 1971 (36 F.R. 12858). Each request contained in the petitions has been evaluated. Particular requests relative to the March 10, 1971, rule not expressly mentioned in this notice or in the notice of July 8 have been denied.

To avoid possible confusion as to the number of test devices to be used in a test, the NHTSA is amending S5.1 at the request of American Motors and General Motors to indicate more clearly that test devices are to be placed at all seating positions unless a lesser number is prescribed in S4.

Several petitioners sought amendment of the readiness indicator requirement in S4.5.2 to limit the components of a deployable system that must be monitored. In particular, it was stated that the integrity of a pressure vessel could be diminished by a pressure gauge, and that the reliability of electrically activated explosive release devices would be impaired if the activating wire had to be monitored. To permit manufacturers to avoid designs that are prone to deterioration, the requirement has been amended by omitting specific reference to compressed gases and electrical circuits.

Several petitions requested changes with respect to the weight at which a multipurpose

passenger vehicle, truck, or bus is to be tested. It was stated that the half-loaded weight specified in the standard was unrepresentative of the weights of vehicles involved in crashes, and that it placed an unreasonably severe strain on the vehicle. On consideration of the data and arguments presented, it has been determined that a reduction in the loading of these vehicles is appropriate. The required vehicle weight is accordingly reduced to 300 pounds plus the weight of the necessary anthropomorphic test devices. It should be noted that instrumentation is to be included as part of the 300 pounds.

With regard to the placement of test devices in the vehicle, it was pointed out that the specified position of the driver's right foot often produced an unnaturally awkward result and that the positioning might be achieved in some cases only by sacrificing some portion of underdash padding. In response to these points, the positioning requirement is amended to permit more natural placement, with the foot in contact with the undepressed accelerator pedal.

The petitions included several objections to the requirements for rollover testing. It was argued that the test did not produce repeatable results with respect to vehicle behavior. The NHTSA has given serious consideration to these arguments, and has conducted a series of vehicle tests according to the procedures of the standard. These tests have demonstrated a high degree of repeatability in vehicle behavior. Occupant ejection in rollover accidents, and the retention of occupants in rollovers is a major element in effective crash protection. The petitions to delete the rollover test from the standard are therefore denied.

Some petitions objected to the requirement for barrier tests at "any angle up to 30° in either

direction from the perpendicular." The NHTSA is aware that such an all-angles test may be more demanding than a test that arbitrarily selects two angles, such as 15° and 30°. Manufacturers are free, however, to limit their testing to the "worst case." Since accidents occur at all angles, it is considered important that vehicles be capable of meeting the protection requirements at any angle within the prescribed limits.

The lateral moving barrier test was also objected to by several petitioners, particularly by manufacturers of smaller vehicles who consider the 4,000-pound weight of the barrier to be excessive. The lateral moving barrier test is included in the standard because of the disproportionately high number of serious injuries suffered in side impacts. The weight of the barrier was chosen to represent the average weight of domestic passenger cars, the vehicles most likely to strike the side of a vehicle, regardless of the impacted vehicle's size. The requirement is retained.

The use of the Severity Index of 1000 as the criterion for head injury was objected to as too stringent, and a more lenient index requested. Considering the present state of the art in head injury measurement, it has been determined that a Severity Index of 1000 is the most acceptable criterion at this time, and it has therefore been retained. In a related objection, Chrysler stated that the 1000-Hz channel class requirement for accelerometers in the head was too high. In the judgment of the NHTSA, however, the 1000-Hz channel class specification as incorporated in SAE J211 represents an acceptable level of instrument sensitivity. The requirement has therefore been retained.

In the context of the petitions regarding the rollover requirements, it was suggested that the requirement of S6.1 that all portions of the test device be contained within the passenger compartment during the test was unnecessarily stringent. In retaining this requirement the NHTSA intends to require a substantial degree of passenger compartment integrity in all types of accidents. The test condition that specifies windows to be in the up position is retained to restrict random excursions of test devices, and to provide for consistency in the evaluation of test results.

General Motors noted in its petition that there are a large number of State and local laws concerning the shipment, storage and use of pressurized cylinders and explosive devices that might be used in air bag systems. Many of these laws are at variance with the regulations of the Department of Transportation's Hazardous Materials Regulations Board governing these materials (found in Chapter 1, Subtitle B, of Title 49, Code of Federal Regulations). If these State and local laws were to be applied to equipment that is part of a large proportion of the new passenger cars in this country, the distribution, sale, use, and maintenance of those vehicles could be seriously hindered. General Motors suggested that the Federal regulations governing these materials be incorporated into the requirements of Standard No. 208, thus preempting all State and local requirements (i.e., requiring them to be identical) under section 103(d) of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392(d). The NHTSA recognizes this problem, and is considering various methods of solving it, in consultation with other concerned agencies. No regulatory action to that end is taken in this notice, but some such action is anticipated in the near future.

Several petitioners noted that the requirements for anthropomorphic test devices specified in the standard, mainly those set forth in SAE Recommended Practice J963, do not completely define all the characteristics of the dummies that may be relevant to their (and the vehicle's) performance in a crash test. The NHTSA considers the comment valid. It would actually be difficult, if not impossible, to describe the test dummy in performance terms with such specificity that every dummy that could be built to the specifications would perform identically under similar conditions. Of course, since the dummy is merely a test instrument and not an item of regulated equipment, it is not necessary to describe it in performance terms; its design could legally be "frozen" by detailed, blueprint-type drawings and complete equipment specifications. Such an action does not, however, appear to be desirable at this time. Considerable development work is in process under various auspices to refine the dynamic characteristics of anthropomorphic devices, to determine which designs are most prac-



licable, offer the most useful results, and best simulate the critical characteristics of the human body. The NHTSA is monitoring this work (and sponsoring some of it), and intends to propose amendments of the standard in accordance with it to add more detailed performance and descriptive specifications for the test dummies, although no changes are being made in that respect by this notice.

In the meantime, it should be understood that the NHTSA does not intend that a manufacturer's status with respect to compliance will be jeopardized by possible variances in test dummies permitted by the present set of specifications. In the agency's judgment, a test dummy that conforms to the specifications incorporated by the standard is an adequate test tool for determining the basic safety characteristics of a vehicle. If the NHTSA concludes after investigation that a manufacturer's tests are properly conducted, with dummies meeting the specifications, and show compliance with the standard, and that differences in results from tests conducted by the agency are due to differences in the test dummies used by each, the agency tests will not be considered to be the basis for a finding of noncompliance.

A number of the petitioners sought a delay in the effective dates of the standard, particularly the August 15, 1973, date which passenger cars are required to provide at least head-on protection for front-seat occupants by means that require no occupant action. Several vehicle manufacturers argued that further time is needed to prepare for the introduction of passive restraint systems in all passenger car lines. They pointed out that much of their effort during the past year has been spent refining and testing the design of these systems in order to ensure satisfactory performance under the most adverse conditions that may be encountered by vehicles in use. Mandatory introduction of passive restraints in all passenger cars by the August 15, 1973, date, it was argued, would impose severe financial hardships, because of the difficulties that would be encountered in obtaining tools, setting up production lines, and working out the inevitable production and quality-control prob-

lems for all their vehicles simultaneously, contrary to the normal practice in the industry.

It has been determined that these petitions have some merit. Materials submitted to the docket concerning the state of passive restraint development indicate that systems now available will meet the requirements of Standard 208 for passive frontal crash protection, and perform satisfactorily in other respects. It does not now appear, however, that tooling and production leadtimes will permit manufacturers to make large-scale introductions of passive systems before the fall of 1973. This agency is aware of the extreme dislocations, and the attendant financial hardships, that would be caused by requiring the world industry (to the extent of the vehicles sold in this country) to introduce major new systems in substantially all their passenger cars at the same time.

For these reasons, it has been determined that manufacturers should be allowed additional time to introduce passive protection systems. To that end, a notice of proposed rulemaking is published in this issue of the *Federal Register* that would allow manufacturers of passenger cars the option of installing seat belt systems with ignition interlocks for the period up to August 15, 1975. It is expected that this added leadtime will enable manufacturers to institute an orderly, phased introduction of passive systems into their vehicles, installing such systems in their various car lines, to the extent feasible, in advance of that date.

The July 8 notice indicated that the standard would be republished in its entirety upon publication of today's action. This has not been done, because of the limited number of amendments made by this notice.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, in § 571.21 of Title 49, Code of Federal Regulations is amended . . .

Effective dates: January 1, 1972, with additional requirements effective at later dates, as indicated in the text of the rule published March 10, 1971 (36 F.R. 4600).



**Effective: January 1, 1972**

(Secs. 103, 108, 112, 114, 119, National Traffic and Motor Vehicle Safety Act, U.S.C. 1392, 1397, 1401, 1403, 1407, delegation of authority at 49 CFR 1.51)

Issued on September 29, 1971.

Douglas W. Toms  
Administrator

**36 F.R. 19254**  
**October 1, 1971**

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# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

## Seat Belt Installations

(Docket No. 2-6; Notice 5)

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard 216, (49 CFR § 571.216) that sets minimum strength requirements for a passenger car roof to reduce the likelihood of roof collapse in a rollover accident. The standard provides an alternative to conformity with the rollover test of Standard 208.

A notice of proposed rulemaking on this subject was issued on January 6, 1971 (36 F.R. 166). As noted in that proposal, the strength of a vehicle roof affects the integrity of the passenger compartment and the safety of the occupants. A few comments suggested that there is no significant causal relationship between roof deformation and occupant injuries in rollover accidents. However, available data have shown that for non-ejected front seat occupants in rollover accidents, serious injuries are more frequent when the roof collapses.

The roof crush standard will provide protection in rollover accidents by improving the integrity of the door, side window, and windshield retention areas. Preserving the overall structure of the vehicle in a crash decreases the likelihood of occupant ejection, reduces the hazard of occupant interior impacts, and enhances occupant egress after the accident. It has been determined, therefore, that improved roof strength will increase occupant protection in rollover accidents.

Standard 208 (49 CFR § 571.208), *Occupant Crash Protection*, also contains a rollover test requirement for vehicles that conform to the "first option" of providing complete passive protection. The new Standard 216 issued herewith is intended as an alternative to the Standard 208 rollover test, such that manufacturers may con-

form to either requirement as they choose. Standard 208 is accordingly amended by this notice; the effect of the amendment, together with the new Standard 216, is as follows:

(1) From January 1, 1972, to August 14, 1973, a manufacturer may substitute Standard 216 for the rollover test requirement in the first option of Standard 208; Standard 216 has no mandatory application.

(2) From August 15, 1973, to August 14, 1977, Standard 216 is in effect as to all passenger cars except those conforming by passive means to the rollover test of Standard 208, but it may continue to be substituted for that rollover test.

(3) After August 15, 1977, Standard 216 will no longer be a substitute for the Standard 208 rollover test. It is expected that as of that date Standard 216 will be revoked, at least with respect to its application to passenger cars.

A few comments stated that on some models the strength required in the A pillar could be produced only by designs that impair forward visibility. After review of strengthening options available to manufacturers, the Administration has concluded that a satisfactory increase in strength can be obtained without reducing visibility.

Some comments suggested that the crush limitation be based on the interior deflection of the test vehicle rather than the proposed external criterion. After comparison of the two methods, it has been concluded that a test based on interior deflection would produce results that are significantly less uniform and more difficult to measure, and therefore the requirement based on external movement of the test block has been retained.

Several changes in detail have been made, however, in the test procedure. A number of com-

ments stated that the surface area of the proposed test device was too small, that the 10-degree pitch angle was too severe, and that the 5 inches of padded test device displacement was not enough to measure the overall roof strength. Later data available after the issuance of the NPRM (Notice 4) substantiated these comments. Accordingly, the dimensions of the test block have been changed from 12 inches square to 30 inches by 72 inches, the face padding on the block has been eliminated, and the pitch angle has been changed from 10 degrees to 5 degrees.

Several manufacturers asked that convertibles be exempted from the standard, stating that it was impracticable for those vehicles to be brought into compliance. The Administration has determined that compliance with the standard would pose extreme difficulties for many convertible models. Accordingly, manufacturers of convertibles need not comply with the standard; however, until August 15, 1977, they may comply with the standard as an alternative to conformity with the rollover test of Standard 208.

A few comments objected to the optional 5,000-pound ceiling to the requirement that the roof have a peak resistance of  $1\frac{1}{2}$  times the unloaded vehicle weight. Such objections have some merit, if the energy to be dissipated during a rollover accident must be absorbed entirely by the crash vehicle. In the typical rollover accident, however, in which the vehicle rolls onto the road shoulder, significant amounts of energy are absorbed by the ground. This is particularly true in heavier vehicles. Some of the heavier vehicles, moreover, would require extensive redesign, at a considerably greater cost penalty than in the case of lighter vehicles, to meet a strength requirement of  $1\frac{1}{2}$  times their weight. At the same time, heavier vehicles generally have a lower rollover tendency than do lighter vehicles. On the basis of these factors, it has been determined that an upper limit of 5,000 pounds on the strength requirement is justified, and it has been retained.

It was requested that the requirement of mounting the chassis horizontally be deleted. It has been determined that the horizontal mounting position contributes to the repeatability of the test procedure and the requirement is therefore retained.

The required loading rate has been clarified in light of the comments. The requirement has been changed from a rate not to exceed 200 pounds per second to a loading device travel rate not exceeding one-half inch per second, with completion of the test within 120 seconds.

A number of manufacturers requested that repetition of the test on the opposite front corner of the roof be deleted. It has been determined that, as long as it is clear that both the left and right front portions of the vehicle's roof structure must be capable of meeting the requirements, it is not necessary that a given vehicle be capable of sustaining successive force applications at the two different locations. The second test is accordingly deleted.

*Effective date:* August 15, 1973. After evaluation of the comments and other information, it has been determined that the structural changes required by the standard will be such that many manufacturers would be unable to meet the requirements if the January 1, 1973 effective date were retained. It has therefore been found, for good cause shown, that an effective date more than one year after issuance is in the public interest. On or after January 1, 1972, however, a manufacturer may substitute compliance with this standard for compliance with the rollover test requirement of Standard 208.

In consideration of the above, the following changes are made in Part 571 of Title 49, Code of Federal Regulations:

1. Standard No. 208, 49 CFR § 571.208, is amended by adding the following sentence at the end of S5.3, *Rollover*: "However, vehicles manufactured before August 15, 1977, that conform to the requirements of Standard No. 216 (§ 571.216) need not conform to this rollover test required."

2. A new § 571.216, Standard No. 216, *Roof Crush Resistance*, is added, as set forth below.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on December 3, 1971.

Charles H. Hartman  
Acting Administrator

36 F.R. 23299

December 8, 1971



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208**

## **Occupant Crash Protection**

**(Docket No. 69-7; Notice 15)**

The purpose of this notice is to respond to petitions requesting reconsideration of the amendments to the seat belt requirements of Standard No. 208, *Occupant Crash Protection*, issued on July 2, 1971 (36 F.R. 12858, July 8, 1971). The petitions are granted in part and denied in part.

The Chrysler Corporation requested an amendment of the belt warning system requirements in S7.3, to provide that the system shall operate only when the vehicle's engine is running. Section S7.3.1 presently requires the warning to operate whenever the ignition is "on", the transmission is in a forward gear, and seat belts are not in use at occupied front outboard seats. Chrysler stated that basing the warning system operation on engine operation would permit simplification of the warning system circuitry. On review, the NHTSA has concluded that the Chrysler position has merit and that requiring warning system operation only when the engine is operating will satisfactorily include the situations in which the vehicle is likely to be in motion, and thereby satisfy the intent of the warning system requirement. S7.3.1(a) is amended accordingly.

It should be noted that a warning system that operates whenever the ignition switch is "on", in accordance with the prior version of S7.3.1(a), will continue to meet the requirement as amended, since such a system will of necessity operate when the engine is running.

Subsequent to the adoption of the passive seat belt requirement, S4.5.3 (Notice 10, 36 F.R. 12858, July 8, 1971), questions have been raised by Toyota, Renault and Volkswagen as to the configuration required of passive belts used in place of active belts. The NHTSA's intent in adopting S4.5.3 was to permit manufacturers to

substitute a Type 2 passive assembly with a detachable or nondetachable shoulder belt for any active seat belt specified under an option of S4, even though the S4 option specifies a Type 1 assembly or a Type 2 assembly with a detachable shoulder belt. The agency also intended to permit the substitution of Type 1 passive assemblies where an option does not require a Type 2 assembly. Thus a passive belt used at the front outboard seating positions to meet the third option in the period beginning January 1, 1972 (S4.1.1.3.1(a)) would have to be a Type 2 assembly. Although no formal petitions have been received on these points, it is considered advisable to amend S4.5.3 to clarify its intent.

The formal petition of JAMA with respect to S4.5.3 requested deletion of the requirement that passive seat belt assemblies must meet the assembly performance and webbing requirements of Standard No. 209. The basis for the request was JAMA's belief that the manufacturer should be allowed as much freedom in the design of a passive belt system to fit the crash characteristics of a particular vehicle as he would have in the design of other types of passive restraints. On reconsideration, the NHTSA has decided that relief from Standard No. 209 should be afforded if a passive belt is capable of meeting the occupant crash protection requirements of S5.1 in a frontal perpendicular impact and amends S4.5.3 accordingly.

The JAMA petition also requested the NHTSA to make it clear that the anchorages of a passive seat belt assembly need not meet the requirements of Standard No. 210. The installation of anchorages is required by Standard No. 210, regardless of the type restraint system in the vehicle. The NHTSA does not consider that a sufficient need has been shown at this time for amendment of

Standard No. 210. Anchorages installed pursuant to that standard are permitted to elongate, so long as they sustain the maximum required force, and such anchorages should therefore be usable in new energy absorbing belt systems.

Ford requested an increase in the minimum warning signal duration from 1 minute to 5 minutes. The NHTSA has considered a variety of alternatives in arriving at the 1-minute level, and remains persuaded that it is a reasonable compromise between the need for warning and the need to avoid undue annoyance in situations where a belt must be temporarily unfastened. The petition is denied.

JAMA requested an amendment to S7.3.3 to provide vehicles with automatic transmissions the option of shutting off the warning signal by use of the parking brake. Although this option is provided for vehicles with manual transmission by S7.3.4 as a concession to cost and lead-time problems of certain manufacturers, there are inconveniences associated with its use on vehicles with automatic transmissions, whose drivers may often prefer to use the "Park" position rather than the parking brake. The petition is therefore denied.

General Motors petitioned for an amendment of S7.3.3 and S7.3.4 to allow warning system activation when the ignition is in the "start" position. The notice issued September 29 proposed amendments to these sections that would require deactivation only when the ignition is in the "on" position. This would permit activation of the system with the ignition in the "start"

position, as requested by General Motors. No adverse comment has been received on this proposal, and favorable action will be taken in the rule to be issued pursuant to the notice of September 29.

In another request concerning S7.3.4(b), JAMA suggested an amendment to permit deactivation of the warning system whenever the parking brake lamp is illuminated. The NHTSA considers such a system to be an acceptable means of conforming to S7.3.4(b) under the present language. Since no further amendment is necessary, the petition for amendment is denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, § 571.208 of Title 49, Code of Federal Regulations is amended . . . .

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on December 9, 1971.

Charles H. Hartman  
Acting Administrator

36 F.R. 23725  
December 14, 1971



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket 69-7; Notice 16)

The purpose of this notice is to amend Standard No. 208, Occupant Crash Protection, as proposed September 29, 1971 (36 F.R. 19266, October 1, 1971) with respect to the occupant protection options available between August 15, 1973 and August 15, 1975. The amendments proposed on September 29 are adopted essentially as proposed, with minor modifications.

The notice proposed a third occupant protection option (S4.1.2.3) for passenger cars manufactured between August 15, 1973 and August 15, 1975. The salient feature of the new option was the use of seat belts equipped with an ignition interlock system that would prevent the engine from starting if any front seat occupant did not have his belt fastened. The belts at the front outboard positions would have to meet the injury criteria of the standard in a 30 m.p.h. frontal barrier crash, and any lap belt in the center position would have to remain intact in the same crash. If shoulder belts were provided at the front positions, they would have to be nondetachable and have emergency locking retractors. Additional features of the interlock system as specified in S7.3.5 included an antidefeat measure that would require the belt to be fastened *after* the occupant is seated, a requirement that unfastening the belt would not stop the engine, and a provision for seat belt warning system operation when the ignition is in the "start" position and a belt is unfastened at an occupied front seat position. With minor exceptions noted in the following discussion, the option is adopted as proposed.

Several comments approved of the interlock option. Mr. Ralph Nader and the Center for Auto Safety raised procedural objections con-

cerning the issue of placing intragovernmental communications in the docket. This issue is presently the subject of litigation in the Federal Courts, and would not be appropriate for discussion herein. The Center also objected that both the interlock option, to begin August 15, 1973, and the passive restraint requirement, beginning August 15, 1975, should be instituted one year earlier. The option that includes the interlock system also requires emergency-locking shoulder belt retractors, however, and the agency has determined that the 1974 model year is the earliest practicable time by which the option can be effectuated. As for the passive restraint requirement to become effective on August 15, 1975, the reasons for setting that effective date were discussed at length in Notice 12 (36 F.R. 19254, October 1, 1971), and need not be restated here.

There were differences of opinion among the comments on the desirability of various other aspects of S4.1.2.3. The requirement of greatest concern appears to be S4.1.2.3(b), which requires the injury criteria to be met at the front outboard positions in a 30-mph frontal barrier crash with the test dummy restrained by the seat belt. It was the intent of the proposal to allow another means of providing the requisite level of occupant protection, not to lower the level of protection. Present information indicates that systems meeting the injury criteria are available using current seat belt technology, and the agency therefore adopts the requirement as proposed.

To allow greater diversity in belt system development, it has been decided to accept the suggestion made in a number of comments that conformity to Standard No. 209 should not be



required of belt systems that meet the injury criteria. Accordingly, those options that require a seat belt to meet the injury criteria (S4.1.1.2, S4.1.2.2 and S4.1.2.3) are amended by limiting the application of Standard No. 209 to belts other than those meeting the injury criteria. A belt provided at a center front position is not required to meet the injury criteria and is therefore required to conform to Standard No. 209.

Related requests for exemption from the anchorage requirements of Standard No. 210 have not been adopted in that they appear to be unnecessary. An amendment to permit anchorages that absorb energy by elongating under force is not necessary, since Standard No. 210 expressly permits deformation so long as the maximum force is sustained. In the absence of other data indicating a need to amend Standard No. 210, no change is proposed in that standard.

Chrysler's suggestion that a shoulder belt shaped as an inverted Y could be used in lieu of a nondetachable upper torso belt has not been adopted, primarily because of the likelihood that it would often go unused. There is nothing to prevent a manufacturer from installing such a belt along with the lap belt, so long as the lap belt alone is capable of meeting the injury criteria.

The interlock requirements were the subject of diverse comments. Some generally endorsed the requirement for interlock at all front positions, some stated that it should not be required at any position, while others suggested that it should be installed only at the outboard seats or only at the driver's seat. Several comments indicated doubts as to the system's reliability and expressed concern about its possible interference with vehicle operation.

Upon review of the comments, the NHTSA has decided to adopt the interlock system as an option applying to all front seating positions. The 1973 options, whether active or passive, are intended to set minimum protection requirements for all front seating positions. If the third option is to give protection better than that of present belt systems, belt usage must be increased. The interlock system has the potential to increase belt usage and is therefore adopted as part of the third option. Exemption of the center

front seat, as proposed by several comments, could result in increased occupancy of the center seat as an easy means of avoiding the effects of the interlock system. The effect of such avoidance would be to substantially lessen the protection afforded occupants, and the requests for center seat exemption are therefore denied. However, in consideration of some technical problems arising from the placement of sensors in the center seats, it has been decided to change the preconditions for warning system and interlock system operation. It was pointed out that the center seat cushion may be depressed far enough to activate the warning signal by the weight of two large men in the outboard positions. To alleviate this problem, S7.3.1(c), S7.3.5.2(b), and S7.4.1 (b) are changed to provide for activation by the weight of a child in the front non-driver positions only when a 50th percentile adult male is seated in the driver's position.

Other problems of convenience arising from the interlock system are dealt with by the addition of two new subsections to S7.4. As a convenience in situations such as parking garages or vehicles stalled in traffic, a new S7.4.3 has been adopted, permitting restarting of the engine within three minutes of shutoff without interference by the interlock system. To facilitate repair and maintenance work, a new S7.4.4 is adopted to permit the interlock to be overridden by a switch that is actuated after opening the cover of the engine compartment. To reduce the possibility that the engine compartment switch will be misused, S7.4.4 provides that the switch will not defeat the interlock unless it is operated after each period of engine operation.

The requirements of S7.3.3 and S7.3.4 have been amended by adding engine operation as a necessary condition for mandatory warning system shutoff. This limits the situation in which the system must not operate; it may now operate when the ignition is in the "start" position, as requested by General Motors.

The relationship of the "start" position to system operation is also affected by the interlock system requirements. S7.3.5.4 requires the warning system to operate when the ignition is in the start position to tell the driver of a vehicle with unbelted front seat occupants why the engine fails to start.

One additional feature of the belts used in interlock systems attracted considerable comment. The amendment to S7.1.1 that would require shoulder belts provided under S4.1.2.3 to have emergency-locking retractors has been adopted as proposed. The NHTSA regards the convenience of an emergency-locking retractor as a significant incentive for belt usage. In response to comments requesting an interpretation as to the number of retractors required, the standard permits a system with a single emergency-locking retractor acting on both lap and shoulder belts. In response to requests for allowance of auxiliary manual adjustment devices, such devices are permissible if they cannot be adjusted so as to cause the belt to fail the automatic adjustment requirements of Standard No. 208.

General Motors raised a question concerning the number of test devices to be used in the frontal barrier crash test specified in S5.1. The NHTSA has interpreted the section as requiring test devices only in those seating positions for which a barrier crash test is specified by S4.

The question is of general interest and is considered significant enough to warrant a clarifying amendment to S5.1 at this time.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, § 571.208 of Title 49, Code of Federal Regulations is amended. The standard is hereby amended upon publication of this notice in the *Federal Register*; effective dates are as stated in the text of the standard.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 17, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 3911**  
**February 24, 1972**





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection—Pressure Vessels and Explosive Materials

(Docket No. 69-7; Notice 18)

The purpose of this notice is to add a new section to Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, 49 CFR § 571.208, dealing with pressure vessels and explosive devices.

After review of the comments to the notice of proposed rulemaking (Docket 69-7, Notice 14, October 9, 1971; 36 F.R. 19705), the agency has concluded that its original assessment of the need for regulation was essentially correct and that a regulation should therefore be adopted. As indicated in Notice 14, the NHTSA sees a regulation of restraint systems such as air bags containing explosive materials or pressure vessels as having two primary functions: to impose directly on manufacturers the obligation to conform to Federal hazardous materials regulations, and to create a uniform system of regulation that will override any conflicting state or local regulation.

The approach taken in the notice was to propose a general incorporation of all applicable portions of the hazardous materials regulations as found in 49 CFR Parts 170-189. Most of the comments, while agreeing with the general intent of the proposal, objected to the breadth of this incorporation as too vague and too likely to result in difficulties of interpretation. There was a consensus that serious problems would arise as a result of the Hazardous Materials Regulations Board's practice of issuing special permits that allow shipment of regulated items that do not conform to the regulations. The majority of devices used in occupant protection systems vary in some way from the requirements of the regulations and have been shipped under one or more special permits. The comments pointed out that adoption of the regulations

without some adjustment to allow for the existence of special permits would effectively prohibit most of these devices.

It has therefore been decided to limit the incorporation of the HMRB regulations by referencing those parts of the regulations from which no variances have been granted. Without exception, the pressure vessels used in air bag systems to date have been manufactured in basic conformity with the recently adopted Specification 39 (49 CFR 178.65). The variances which have caused the manufacturers to obtain special permits have been variances in the choice of materials and in the method of fabrication. All cylinders have been able to conform to the basic performance requirements of the specification, so that an incorporation into Standard 208 of the performance requirements of Specification 39 would enable manufacturers to continue to make their present systems.

Taken together, the performance requirements are considered by the NHTSA to be an adequate regulation of the safety of pressurized containers in occupant restraint systems. The HMRB will continue to exercise its jurisdiction over the shipment of the systems, so that a manufacturer will still have to obtain a special permit in order to ship systems that do not conform to the specification. The adoption of section S9 is not intended in any way to diminish the responsibilities of a manufacturer under the applicable regulations of the HMRB. For example, evidence of the requisite number of tests and inspections will continue to be required for shipment under the HMRB regulations, even though failure to test and inspect will not be a violation of Standard 208.

As adopted, the section consists of two subsections, the first dealing with pressure vessels and the second with explosives. The pressure vessel subsection applies to vessels that are designed to be continuously pressurized, as distinguished from systems that are pressurized only during actuation. A pressure vessel that contains an explosive charge as well as gas under continuous pressure will have to conform to both subsections.

A continuously pressurized vessel is required to conform to the requirements of Specification 39 concerning type, size, service pressure, and test pressure of vessels (paragraph 2 of the Specification); seams (6(b)); wall thickness (7); openings and attachments (9(a) and (b)); safety devices (10); pressure tests (11); and flattening tests (12). The reference to the latter two paragraphs are drafted to make it clear that the quality control aspects of those paragraphs are not included in the standard. The remaining portions of Specification 39, including the inspection requirements of paragraphs 3, 4, and 15, the material specifications of paragraph 5, the rejected cylinder procedure of paragraph 13, and the markings requirement of paragraph 14, are not incorporated.

Review of the explosives provisions of the hazardous materials regulations showed that some of the requirements, if applied literally, would not be appropriate for automotive installations. For instance, certain types of pyrotech-

nic inflators are categorized as explosive power devices and are required to be shipped in fiberboard or wooden containers. Neither of these types of containers would be proper for a system designed to protect occupants in a vehicle from the effects of a crash. The primary needs are for a requirement that sets limits on the sensitivity of the explosive and one that requires it to be in a container that will protect the occupants of the vehicle from the effects of inadvertent ignition. These requirements are hereby adopted, in accordance with comments made by General Motors.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

*Effective date:* June 12, 1972. Because of the immediate need to establish a uniform system of regulation, good cause is found for an effective date sooner than 180 days after issuance.

This amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407 and the delegation of authority at 49 CFR 1.51.

Issued on May 3, 1972.

Douglas W. Toms  
Administrator

37 F.R. 9222  
May 6, 1972



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection

(Docket No. 69-7; Notice 19)

The purpose of this notice is (1) to adopt the method of calculating head injury proposed in Notice 17 of Docket 69-7 (37 F.R. 5507) as an amendment to S6.2 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, and (2) to respond in part to petitions for reconsideration of the amendments to the standard published in Notice 16, February 24, 1972 (37 F.R. 3911). The issue involving Notice 16 addressed by this notice is the applicability of the head injury criterion of S6.2 to seat belt restraint systems. Action on the remaining issues has been scheduled for completion not later than July 1, 1972.

#### *I. Calculation of head injury criterion.*

Some substantive objections were raised to the proposed method of calculating the head injury criterion. Several comments questioned the use of resultant accelerations rather than the anterior-posterior accelerations used in the original development of the Wayne State University Tolerance Curve. Although the curve was originally based on anterior-posterior acceleration data, its validity for resultant accelerations appears to be confirmed by subsequent tests using resultant accelerations computed from biaxial accelerometers. Resultant accelerations have therefore been used in the amended criterion.

The question of the permissible level was again raised, with some commenters supporting a level of 1500 even under the revised method of calculation. This agency's position is that adequate justification has not been demonstrated for a numerical increase in the severity level, although adjustments in the method of calculation adopted herein may have the effect of allowing greater cumulative accelerations than would have been allowed under the Gadd Severity Index. With

the new calculation, the higher numerical level is less supportable than before and it is accordingly rejected. The amendment to S6.2 is adopted as proposed.

#### *II. Applicability of the head injury criterion to seat belt systems.*

The decision to postpone the date of mandatory installation of passive restraints until August 15, 1975, was made in consideration of the hardship that would have been imposed on many manufacturers by a requirement to provide passive restraints by the original date of August 15, 1973. The injury criteria of the standard, measured in a barrier crash with instrumented dummies, were applied to belt systems as well as passive systems that might be used to meet the requirements of the standard, beginning August 15, 1973.

Several manufacturers have petitioned for the removal of the injury criteria, particularly those for head injury, from the belt system tests. Their concern arises from their test results indicating that in many vehicles currently available belt systems either do not meet or only marginally meet the head injury criteria. They have argued that much, perhaps most, of the acceleration that contributes to the head Severity Index measurement with a shoulder-belted dummy occurs as the head flops loosely forward without striking anything in the vehicle. Actual field collision data, they maintain, does not indicate that this type of head movement by shoulder-belted vehicle occupants in a crash is a serious injury-producing factor. They question the correlation between results of the dummy tests and the actual protective characteristics of the belt systems.

The NHTSA recognizes the uncertainty concerning the significance of head movement by a shoulder belted occupant whose head does not



strike the forward part of the vehicle, although it considers the present evidence too scanty to be conclusive in either direction. It also recognizes that the leadtime for any major design or component changes for the 1974 models has been virtually exhausted. Recent materials submitted to the docket indicate that presently existing inflatable restraint systems can meet the head injury criteria with little difficulty. The inherent limitations in lap-and-shoulder-belt systems make it considerably more difficult for those systems to meet these criteria, although belt systems have been found to provide protection at moderate speeds.

For these reasons, it has been decided that a temporary modification in the head injury measurements for belt systems is justified. The amendment made by this notice in response to the petitions affects vehicles manufactured before August 15, 1975, and provides that measurement of head acceleration begins, for purposes of computing the head injury criterion for belted dummies, only at the moment at which the head strikes some portion of the vehicle other than a belt. The measurement will thus include any contact with the windshield or dashboard, for example, or the effects of rebound against the seat back, but pre-impact accelerations of the head will be excluded.

This agency will examine closely the accident data bearing on the traumatic effect of non-

impactive head accelerations, as well as such laboratory data as may be gathered, for example from cadaver studies. Work is also in progress concerning the correlation between dummy and human behavior, with a view to more sophisticated instrumentation and measurement of vehicle performance, and to continued evaluation of the head injury criterion for the entire test crash event.

In consideration of the foregoing, paragraph S6.2 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

*Effective date:* July 24, 1972.

Because this amendment modifies an existing rule in a manner that imposes no additional substantive requirements, it is found for good cause shown that an effective date less than 180 days from the date of issuance is in the public interest.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on June 20, 1972.

Douglas W. Toms  
Administrator

37 F.R. 12393  
June 23, 1972

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection in Passenger Cars,  
Multipurpose Passenger Vehicles, Trucks and Buses****(Docket No. 69-7; Notice 20)**

The purpose of this notice is to respond to petitions for reconsideration of the seat belt interlock requirements of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, as published February 24, 1972 (37 F.R. 3911). The issues in the petitions relating to the applicability of the head injury criterion of S6.2 to seat belt systems have been answered in a notice published June 24, 1972 (37 F.R. 12393). The remaining issues are discussed herein.

Several petitions raised issues which, while of considerable importance, lie outside of the immediate scope of the notice under review. Among these are requests to exempt vehicles that meet the injury criteria from the requirements of Standards Nos. 201, 203, 204, and 212, and to waive some of the requirements of Standard No. 209 relating to the width and elongation of webbing. As indicated in the Program Plan for Motor Vehicle Safety Standards, several of these matters are under review at the present time. Their resolution will await the issuance of rule-making notices in the respective dockets.

General Motors reiterated its opposition to the requirements for rollover protection and for the protection of rear seat occupants by passive means. Although these issues may be affected by the receipt of additional information, the NHTSA has not found sufficient cause to alter its position.

With respect to the interlock option itself, the petitioners objected less to the concept of such a system than to the positions at which it would have to be installed and to the level of protection required of it. Some requested an indefinite

extension of the interlock requirements beyond August 15, 1975, as a more or less permanent substitute for passive protection. Inasmuch as the NHTSA continues to consider the 1975 date to be a reasonable date for the installation of passive systems, it must again deny the requested delay.

The application of the interlock and belt warning systems to the center front seating position drew a number of adverse comments. It was stated that the center seat occupancy rate was too low to justify the added cost of installing the system and that the system would be prone to inconvenient activation, as when two large men at the outboard positions depress the center seat cushion. On the question of cost effectiveness, the agency has found that the available data do not support the petitioners. Despite the relatively low occupancy rate, the incremental cost of installing the system is low enough to create a favorable ratio. The requirement for center seat installation is therefore retained. To avoid the problems of over-sensitivity, it has been decided to raise the threshold weight at which activation is required, in accordance with a suggestion by American Motors. The relevant sections (S7.3.5.2(b) and S7.4.1(b)) are accordingly amended to refer to a 5th-percentile adult female rather than to a 50th-percentile 6-year-old child.

The petitions directed their strongest objections to the application of the injury criteria to belt systems. Partial relief has been granted to belt systems with respect to the head injury criterion. The chest and femur criteria, to which a lesser amount of criticism has been directed,



are not considered to present the same level of difficulty for belt systems of current design as the head.

However, it has been decided to make an interim adjustment of the chest injury criterion with respect to seat belts by applying to them a criterion using the severity index formerly applied to the head. The effect of this is to ease the requirement somewhat without permitting excessive long duration accelerations. A well designed belt system of the current types will be capable of meeting the revised criterion. It is expected that improvements now in prospect will allow belt systems to meet the 60 "g's", 3 milli-second criterion in 1975. Femur loads are not a problem for seat belt systems that do not separate during impact, and the femur criterion is therefore retained.

Ford stated in its petition that two barrier tests would be required under S4.1.2.3(d) and (e) for some vehicles, due to the difficulty of placing three 50th-percentile male dummies in the front seat. Although it may be that correct placement cannot be made in Ford vehicles, Ford is at liberty to devise a method of testing the center position which imposes a stress on the belt system equivalent to that of a 50th-percentile adult male. It does not appear that the size of the dummies will prevent most cars from being tested with the dummies three abreast, if the manufacturers elect to conduct S4.1.2.3.1(d) and (e) as a single test. Ford's petition is therefore denied.

General Motors, alone among the petitioners, suggested the use of a sequenced warning system in place of the interlock system. In part the company's position was grounded on the belief that the standard presently requires a sequenced warning and that the interlock is therefore a redundant system. In fact, the opposite is true under the present wording of the standard, in that S7.3.2 states that the warning system shall not operate when the belt is extended to a specified length or, alternatively, when the belt is buckled. Because a sequential warning system would necessarily cause the signal to operate in some situations despite the belt's being extended or buckled, it would not be allowed under S7.3.2.

In response to the GM request to substitute the sequenced warning for the interlock, the NHTSA has concluded that the interlock coupled with a nonsequenced warning provides a somewhat more direct incentive to belt usage with less potential for causing irritation while the vehicle is in operation. The interlock feature is therefore being retained. However, in the light of GM's expressed preference for a sequential warning and in response to a petition by the Japan Automobile Manufacturers Association to permit sequential operation of the warning, it has been decided to amend S7.3.2 to permit manufacturers to use a sequenced warning in conjunction with the interlock system.

The Japan Automobile Manufacturers Association requested the addition of the phrase "after the seat has been occupied" to S7.3.2(a) and (b). Because this would have the effect of requiring all warning systems to be sequenced, paragraphs (a) and (b) are not being amended. Instead, a new paragraph (c) is being added as a third mode of warning system shut off. Although by its terms the new paragraph applies only to front outboard positions, S7.3.5.3 will operate on it as on the other paragraphs to apply it to the center front position as well.

It should be pointed out that a manufacturer adopting the sequential option will be free to incorporate anti-bounce features into the system to prevent its being knocked out of sequence when the occupant lifts off the seat momentarily. This is so because under S7.3.1 the warning system is required to operate only when the belts have not been extended or buckled. If the occupant, in moving about on the seat, does not unbuckle or retract the belt, the warning would not be *required* to operate and the manufacturer could therefore provide for nonoperation in such situations.

Toyota has requested the application of S7.4.3 and S7.4.4 to the warning system as well as the interlock. Because of the possibility that such an amendment would result in the warning system's activating unexpectedly while the vehicle is in motion, the petition is denied.

Several petitions addressed the convenience features of the interlock system in S7.4.3 and S7.4.4. Chrysler stated that it understood the



reference in S7.4.3 to "after the engine has been stopped" to mean after the ignition has been turned off, so that a stalled engine could be restarted indefinitely so long as the ignition is not turned off. This interpretation is essentially correct. The quoted phrase refers to the act of stopping the engine, rather than to involuntary engine stoppage. However, to make it clear that the engine may be restarted indefinitely if the engine has not been turned off, the section is being amended to make its intent explicit.

General Motors stated that it would be desirable for the engine starting system to be operable indefinitely without interference from the interlock system after the engine is stopped so long as the driver has not left his seated position. Such a provision would be an alternate means of permitting restarting in emergency road situations and it is therefore being adopted as part of S7.4.3.

As amended S7.4.3 continues to refer to starting after the engine has stopped, to make it clear that the features of S7.4.3 will not interfere with the primary function of the interlock system. Although it is not necessary for the engine to operate under its own power, the engine starting system must at least be operated in a manner that would start a functional engine in order for the convenience features to have any effect.

A related issue arises in the context of S7.4.4, which refers to restarting "after each period of engine operation." Chrysler interprets this to mean the cycling of the ignition switch from "off" to "on" to "off" again. Although the lan-

guage does not support this meaning, on reconsideration it has been decided that there are advantages to an engine compartment switch that does not require the engine to rotate in order to be reset. The section is therefore being amended to refer to the cycling of the ignition switch rather than to engine operation.

The requirement that the switch be operated each time in order to permit engine starting is being retained despite the request of several petitioners for a system that would permit unlimited restarting so long as the hood is open. The agency's primary objection to such a system is that it is too easy to override permanently. The system allowed by S7.4.4 may be somewhat less convenient, but it is also less defeatable and is therefore preferred. The switch may be located so that it will be operable by the raising of the hood, as requested by several petitioners.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

*Effective Date:* 180 days after publication in the *Federal Register*.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. § 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on June 30, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 13265**  
**July 6, 1972**



## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208**

### **Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses**

**(Docket No. 69-7; Notice 22)**

The purpose of this notice is to specify the effective date for the amendment to Motor Vehicle Safety Standard No. 208 published July 6, 1972, (Notice 20; 37 F.R. 13265). In the effective date provision of the notice, it was stated that the amendment became effective 180 days after publication in the *Federal Register*. Calculation of 180 days from July 6, 1972, the publication date, results in an effective date of January 2, 1973. For reasons of consistency and clarity, it has been found preferable to establish January 1, 1973, as the effective date.

The amendment to Motor Vehicle Safety Standard No. 208, 49 CFR 571.208, published at

37 F.R. 13265 is therefore made effective January 1, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on August 3, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 16186  
August 11, 1972**





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars,  
Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69-7; Notice 23)

The purpose of this notice is to reply to petitions filed pursuant to 49 CFR 553.35 requesting reconsideration of the requirements of Motor Vehicle Safety Standard No. 208 relating to seat belts in vehicles manufactured after August 15, 1973, as amended by Notices 19 and 20 of Docket 69-7 (37 F.R. 12393; 37 F.R. 13265).

1. *Seat belts and the injury criteria of S6.* The primary objection raised by petitioners is that Notices 19 and 20 did not altogether revoke the requirement that seat belts used to meet the 1973 interlock option must be capable of meeting the injury criteria of S6. Although review of the petitions suggests that additional modification of the head injury criterion is advisable, the NHTSA declines to grant petitioners' request for complete relief from the injury criteria.

Review of the petitions for reconsideration of Notice 16 showed that belts would have difficulty meeting the full criteria. Since leadtime was insufficient for major design changes in belts before 1973, it was found necessary either to remove the injury criteria or modify them so that the changes needed to enable belts to conform could be made in 1973.

Upon review, it was concluded that the injury criteria, even in modified form, would have the beneficial effect of regulating the overall protection characteristics of the occupant compartment and belt system. Regulation of the seat belt as a separate component, as in Standard 209, does not insure that the belt will be installed in a manner calculated to insulate the occupant from injurious contact with the interior of the vehicle. It was therefore decided to retain the injury criteria, with such modifications as seemed neces-

sary to allow manufacturers to conform to S4.1.2.3 by August 15, 1973.

The most significant, though by no means the only, agent of head injury is impact with the vehicle interior. In reviewing the petitions on Notice 16, it was decided that no interim criteria would be acceptable that disregarded any impact-related accelerations. Notice 19 therefore amended the head injury criterion in a manner that was intended to include all impact accelerations and to disregard the effect of non-impact accelerations. As several petitioners point out, however, the amendment did not fully carry out this intent. S6.2, as amended, would have disregarded only those accelerations occurring before the head impacted the vehicle and would have counted all accelerations after that point. One effect of this formula was that a glancing impact, in itself insignificant, would cause all subsequent non-impact accelerations to be counted even though such accelerations would not be distinguishable in kind from the pre-impact acceleration. To avoid this result, the agency has decided to include in the calculation of the head injury criterion only those accelerations that occur while the head is in contact with the vehicle.

Some petitioners suggested that even while the head is touching the vehicle, a significant part of the head's deceleration is due to the restraining action of the belt and not to the surface the head strikes. Although there is undeniably more than one force that contributes to head deceleration, the force produced by the impacted surface becomes increasingly important as the duration of the impact increases. If the accelerations during an impact are of such an

amplitude and duration that a HIC value of 1,000 is approached, the acceleration caused by the belt is generally insignificant. The criterion therefore counts all accelerations during the impact phase.

The chest injury criterion of S6.2 was modified for seat belts by Notice 20, which substituted a severity index of 1,000 for the 60g 3 millisecond criterion applied to other restraint systems. Although the use of the severity index as an indicator of chest injury has not been common practice, the agency has decided that it provides a reasonable interim measure of the effectiveness of the belt system. The severity index of 1,000 is therefore retained as the criterion for belt systems until August 15, 1975.

2. *Passive belts and injury criteria after August 15, 1975.* Several petitioners stated that any relief granted to seat belts in the period 1973-1975 should be extended to passive belt systems in the period beyond 1975. However, the NHTSA adopted the interim criteria out of consideration for lead time problems, not because it considered them to be fully satisfactory. The agency does not consider any criterion to be acceptable, on a permanent basis, that omits potentially injury-causing accelerations from its computation. Even though impact accelerations may be the major threat to belted occupants, the effects of non-impact accelerations are not negligible and should not be ignored. It is expected that belts will be able to meet the full injury criteria by 1975. The petitions requesting extension of the modified criteria beyond 1975 are therefore denied.

3. *MPV's and trucks manufactured before August 15, 1977.* The adoption of the interlock option for passenger cars under S4.1.2.3 permitted multipurpose passenger vehicles and trucks of less than 10,000 pounds GVWR to continue to use belt systems (with interlocks) in the period between 1975 and 1977. The agency's intent was to permit these vehicles to have the same interlock system during 1975-1977 that is permitted for passenger cars during 1973-1975. In response to several petitioners, who pointed out that S6.2 and S6.3 could be understood to require these vehicles to meet the full injury criteria during this period, the sections are hereby amended to extend the injury criteria modifications until August 15, 1977, for MPV's and trucks of less than 10,000 pounds GVWR.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208, is amended. . . .

Effective date: August 15, 1973.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on October 18, 1972.

Douglas W. Toms  
Administrator

37 F.R. 22871  
October 26, 1972



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

## Occupant Crash Protection

(Docket No. 69-7; Notice 25)

The purpose of this notice is to amend the injury criteria specified for the chest and femur under sections S6.3 and S6.4 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208. The amendments adopted hereby are those proposed in a notice of proposed rulemaking published on October 28, 1972 (Notice 24; 37 F.R. 23115).

The injury criterion for the chest is amended with respect to all vehicles manufactured before August 15, 1975, by substituting a severity index value of 1,000 as the measure of injury potential in place of the criterion of 60g's for 3 milliseconds. The substitution had previously been made for vehicles equipped with seat belt systems manufactured before August 15, 1975. The amendment made hereby is based on a finding that the severity index is an acceptable interim measure for restraint systems other than belt systems.

Several comments noted an oversight in Notice 24 concerning the application of the modified chest criterion to multipurpose passenger vehicles and trucks having GVWR's of 10,000 pounds or less. As a result of a previous notice (Notice 23; 37 F.R. 22871, October 26, 1972), these vehicles had been permitted to meet the modified criterion until August 15, 1977. Notice 24 failed to reflect this change. The omission has been corrected in the amended version of S6.3, and a parallel extension has been made for vehicles other than passenger cars that have restraint systems other than belts.

The injury criterion for the upper legs is amended to specify a maximum force of 1700 pounds on each femur rather than the previously

specified force of 1400 pounds. The new requirement is considered to provide a good level of protection in crashes in the 30 m.p.h. range and allows manufacturers greater latitude in designing systems for protection at higher speeds.

None of the comments disagreed with the proposal for an increase in force level, although the Ford Motor Company suggested a further amendment that would permit higher forces for a cumulative interval of not more than 3 milliseconds, thereby disregarding extremely short period acceleration peaks which Ford considers to be artificial products of the dummy's metallic structure. A similar request has been made by General Motors in a recent petition for rulemaking. The agency has not yet completed its evaluation of this issue. If favorable action is decided upon, a notice of proposed rulemaking will be issued to permit additional comment.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208, is amended . . .

Because this amendment relieves a restriction and imposes no additional burden, an immediate effective date is found to be in the public interest.

*Effective date:* November 23, 1972.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on November 20, 1972.

Charles H. Hartman  
Acting Administrator

37 F.R. 24903

November 23, 1972



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Seat Belt Interlock Amendments****(Docket No. 69-7; Notice 27)**

The purpose of this notice is to amend the seat belt interlock requirements of Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208). The amendments relate to the performance requirements applicable to the belts, the positions at which the interlock is to be provided, and the convenience features allowed in certain driving situations.

The amendments adopted hereby were initially proposed in a notice published April 20, 1973 (Docket 69-7, Notice 26; 38 F.R. 9830). Some of the amendments proposed in Notice 26 have been adopted in revised form as a result of the comments. One proposal, concerning an alternative interlock system, is not adopted by this notice and awaits further rulemaking action as discussed below.

*I. Amendments.* In Notice 26, it was proposed to amend Section S4.1.2.3, the section establishing the seat belt interlock option, by deleting the requirement that the belts in the front outboard positions meet the injury criteria of S5.1 and by deleting the requirement that the belt at the center front position meet a breakage test in a barrier crash. It was also proposed to delete the requirement for an interlock at the center front position.

Subject to continuing reservations about the interlock system itself, the comments were generally favorable to the proposed amendments. The mandatory requirements for meeting the injury criteria at the outboard positions and the breakage test at the center front position are hereby deleted, as proposed.

There were objections to certain details of the proposal. Under the injury criteria version of S4.1.2.3, manufacturers were allowed to install either Type 2 seat belts (lap and shoulder belt

combinations) or Type 1 seat belts (lap belt). Without the injury criteria as a control on the performance of the lap belt, it was proposed in Notice 26 to delete the Type 1 belt option under S4.1.2.3.1(a). Ford Motor Company stated that if Type 1 belts were not permitted, evaluation of systems employing lap belts in conjunction with passive upper torso restraint would be inhibited. Although belts may be used with passive restraints under the second restraint option in 1973 (S4.1.2.2), second option systems must be capable of providing fully passive protection in a frontal crash. To permit evaluation of systems that may not have full passive capability, it has been decided to continue to permit Type 1 belts under the third option (S4.1.2.3(a)) on the condition that they are capable of meeting the injury criteria of S5.1 in a frontal perpendicular crash.

As amended, therefore, S4.1.2.3.1(a) provides that at the front outboard positions a manufacturer may install either a Type 2 seat belt assembly that conforms to Standard No. 209, or a Type 1 seat belt assembly that meets the injury criteria of S5.1. Insofar as the injury criteria themselves are contingent upon the establishment of an adequate method of measurement through the adoption of a new test dummy, a manufacturer who intends to produce vehicles with Type 1 belts at the front outboard positions will have to await the adoption of the new dummy regulation and its incorporation into the options under S4.1.2.

The proposed deletion of the interlock requirement for the center front position (S4.1.2.3.1(b)) was favorably received, and the requirement is hereby deleted. It was stated by Ford, Chrysler, and American Motors that the warning system at that position should also be deleted. The



merits of the warning system at the center position, in the form of increased belt usage, are considered by NHTSA to outweigh its drawbacks. Although it is fair to say that the warning system will be somewhat more likely to fail with three sensors in the system than with two sensors, the agency does not consider the increment to be sufficient to justify deleting the warning system. The temporary difficulties that Chrysler and American Motors will experience in the severance of the interlock from the warning system are also not considered sufficient grounds for deletion of the warning system. Section S4.1.2.3.1(b) is therefore adopted as proposed in Notice 26. The remaining provisions of S4.1.2.3 were not objected to, and are also adopted as proposed.

A request to clarify section S7.4.1, by amending the second sentence of the section to refer to "each occupied front outboard seating position," has been favorably considered and is adopted hereby.

An amendment to S7.4.3 was proposed to allow an additional "free-start" mode, whereby the manufacturer could install a timer that would be actuated by the seat switch and that would allow the vehicle to be started without belt operation within a period of up to three minutes after the driver leaves his seat. Reaction to the proposal was favorable. In particular, the National Parking Association indicated that such a provision would alleviate most problems in the parking of cars in garages. The amendment is being adopted as proposed.

The proposed addition of section S7.4.5 proved unexpectedly controversial, due to an apparent divergence of opinion on the question of whether, without S7.4.5, a seat bounce switch would be permitted for the interlock system. It has been the opinion of NHTSA that the interlock requirements do not permit the starter to operate in the event that a person who has operated the belt in the correct sequence gets off the seat and returns to it before attempting to start the car. The majority of manufacturers construed the interlock requirements as permitting operation in the situation just described, and had therefore designed their systems with seat bounce switches. Rather than appearing permissive, as intended,

the 10 second bounce switch proposed by S7.4.5 was therefore seen by most manufacturers as unduly restrictive.

Upon consideration of the comments, the agency has concluded that the predominant varieties of bounce switch described by the comments can be accommodated by a modest revision of the section. Two main types of switch were described, one involving a timer set for intervals of from ten seconds to a minute and a half or more, and the other involving the door switches in the circuit, so that after being correctly sequenced the system would allow the car to be started despite "bounces" of any duration, so long as the doors have not been opened. As adopted, the section permits a manufacturer to choose either system. If he chooses a timed system, he may allow any time up to three minutes. Each of the varying time periods described in the comments would therefore be allowed.

The proposed alternative interlock system, S7.5, was treated favorably or neutrally in the comments, although none indicated plans to adopt such a system. The agency continues to regard the alternative system favorably, but on review of the comments has concluded that there is merit to the suggestion that the convenience features established for the primary interlock system should also be applied to the alternative system. In addition, it appears desirable to incorporate a requirement for warning system operation similar to that of S7.3.5.4 to tell a driver who has not operated his belt why the car cannot be moved. Final action on the proposed S7.5 is therefore being delayed in order to obtain comments on additional features of the system that are to be proposed in an upcoming notice.

II. *Other related matters.* After the publication of Notice 26, several comments and petitions were received on the subject of seat belts and the seat belt options. In its comment to Notice 26, Toyota restated its earlier request for amendment of Standard 209 to permit narrower webbing for portions of the belt that do not touch the occupant. Favorable action on this request is proposed in a notice published in today's edition of the *Federal Register* (38 F.R. 12414).

In a petition for rulemaking submitted May 15, 1973, Nissan Motor Company requested an

amendment of the seat belt option that is in effect until August 15, 1973 (S4.1.1.3). The option presently requires all front outboard seat belts to meet a breakage test in a 30 mph barrier crash (S4.1.1.3(c)). Nissan stated that the finding in Notice 26 that the breakage test does not contribute significantly to the strength of the belt should be extended to belts in vehicles manufactured before August 15, 1973, as well as to belts in vehicles manufactured after that date, and that S4.1.1.3(c) should be deleted accordingly. The agency agrees with Nissan that that finding in Notice 26 is equally applicable to pre-August vehicles, but it does not consider an amendment of the standard necessary to afford the relief Nissan requests. Although the opinions in *Chrysler v. DOT*, 474 F.2d 659 (6th Circuit 1972) and *Ford v. NHTSA*, 473 F.2d 1241 (6th Circuit, 1973), did not deal directly with the non-passive options in effect before August 15, 1973, a side effect of the court's invalidation of the test dummy specifications of S8.1.8 is to leave the belt breakage test of S4.1.1.3(c) without a means of measurement.

The agency has concluded that the belt breakage test of S4.1.1.3(c) is without effect in the absence of a test dummy. It will therefore not seek to enforce the requirement. In view of the short time remaining before S4.1.1.3 and other current options lapse in favor of the August 15, 1973 options, this interpretation will have a marginal effect on currently produced vehicles, all of which have been certified as complying with the breakage test. It may, however, be of benefit to manufacturers who plan to introduce their 1974 models prior to August 15, 1973.

Several comments stated that the passive restraint requirement for August 15, 1975, and August 15, 1977, should be deleted from the text of the standard as a result of *Chrysler v. DOT*, *supra*, and reinstated only after issuance of the dummy regulation. A petition filed by the Center for Auto Safety, in contrast, seeks to have the August 15, 1975, date established as promptly as possible. The NHTSA position is that the decision in *Chrysler v. DOT* suspends the mandatory passive restraint requirements, regardless of whether they remain in the text of the rule, and that their deletion at this time would have no

effect other than to require additional work at a later date.

Rulemaking, in addition to that now in progress with respect to the optional passive requirements, will be necessary in order to reestablish the date when passive restraints will be required. Before such rulemaking can be initiated, NHTSA is obliged to consider the comments it receives on the proposed test dummy regulation.

There has been some residual uncertainty as to the effect of the denial in Notice 26 of the petitions requesting restraint options in place of, or in addition to, the interlock system. The agency denied the petitions "to the extent that the petitions seek removal of the interlock requirement from the front outboard seats. . . ." It intended thereby to deny those petitions that would have added a fourth restraint option in addition to the interlock as well as to deny those that sought deletion of the interlock, and the language of denial in Notice 26 should be so construed.

The alternative interlock system proposed by Mr. Jesse R. Hollins, which was not discussed in detail in Notice 26, had been reviewed at the time of Notice 26 and was intended to be denied. The agency has again reviewed Mr. Hollins' petition and has again concluded that the benefits of his proposed system do not warrant the creation of such an alternative interlock system. His petition is accordingly denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, 49 CFR § 571.208, is amended in pertinent part as set forth below. Because this amendment imposes no additional burdens an effective date earlier than 180 days after issuance of this notice is found to be in the public interest.

Effective date: August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407; delegations of authority at 38 F.R. 12147.

Issued on June 15, 1973.

James E. Wilson  
Associate Administrator  
Traffic Safety Programs

38 F.R. 16072

June 20, 1973





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection

(Docket No. 73-8; Notice 2)

The purposes of this notice are (1) to adopt a regulation that specifies a test dummy to measure the performance of vehicles in crashes, and (2) to incorporate the dummy into Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208), for the limited purpose of evaluating vehicles with passive restraint systems manufactured under the first and second restraint options between August 15, 1973, and August 15, 1975. The question of the restraint system requirements to be in effect after August 15, 1975, is not addressed by this notice and will be the subject of future rulemaking action.

The test dummy regulation (49 CFR Part 572) and the accompanying amendment to Standard No. 208 were proposed in a notice published April 2, 1973 (38 F.R. 8455). The dummy described in the regulation is to be used to evaluate vehicles manufactured under sections S4.1.2.1 and S4.1.2.2, (the first and second options in the period from August 15, 1973, to August 15, 1975), and the section incorporating the dummy is accordingly limited to those sections. The dummy has not been specified for use with any protection systems after August 15, 1975, nor with active belt systems under the third restraint option (S4.1.2.3). The recent decision in *Ford v. NHTSA*, 473 F. 2d 1241 (6th Cir. 1973), removed the injury criteria from such systems. To make the dummy applicable to belts under the third option, the agency would have to provide additional notice and opportunity for comment.

By invalidating the former test dummy specification, the decision in *Chrysler v. DOT*, 472 F. 2d 659 (6th Cir. 1972), affected the restraint options in effect before August 15, 1975, as well as the mandatory passive restraint re-

quirements that were to be effective after that date. A manufacturer who built cars with passive restraints under one of the options would therefore be unable to certify the cars as complying with the standard, as illustrated by the necessity for General Motors to obtain a limited exemption from the standard in order to complete the remainder of a run of 1,000 air-bag equipped cars.

The immediate purpose of this rulemaking is to reconstitute those portions of the standard that will enable manufacturers to build passive restraint vehicles during the period when they are optional. The test dummy selected by the agency is the "GM Hybrid II", a composite developed by General Motors largely from commercially available components. GM had requested NHTSA to adopt the Hybrid II on the grounds that it had been successfully used in vehicle tests with passive restraint systems, and was as good as, or better than, any other immediately available dummy system. On consideration of all available evidence, the NHTSA concurs in this judgment. One fact weighing in favor of the decision is that General Motors has used this dummy to measure the conformity of its vehicles to the passive protection requirements of Standard 208, in preparation for the announced introduction of up to 100,000 air-bag-equipped vehicles during the 1974 model year.

No other vehicle manufacturer has announced plans for the production of passive restraint systems during the optional phase, nor has any other vehicle manufacturer come forward with suggestions for alternatives to Hybrid II. The NHTSA would have considered other dummies had some other manufacturer indicated that it

was planning to produce passive restraint vehicles during the option period and that some other dummy had to be selected in order to allow them to proceed with their plans. If there had been any such plans, NHTSA would have made every effort to insure that a test device satisfactory to said manufacturer would have been selected.

This agency recognizes that since various types of dummy systems have been in use under the previous specification, any selection of one dummy, as is required by the *Chrysler* decision, will necessitate readjustments by some manufacturers. However, considering the quantity of GM's production, the scope and advanced state of its passive restraint development program, and the fact that the Hybrid II does not differ radically from other dummies currently in use, in the NHTSA's judgment that dummy represents the best and least costly choice. That conclusion has not been contradicted by the comments to the docket.

The agency will not make any final decision regarding reinstatement of mandatory passive restraint requirements without further notice and opportunity for comment. Should the agency propose mandatory passive restraint requirements, the question of the conformity of the dummy that is chosen with the instructions of the court in *Chrysler* will again be open for comment. The NHTSA strongly encourages the continuance of the dummy test programs mentioned in the comments, in the hope that any problems that may arise can be identified and resolved before the dummy specifications for later periods are issued.

The Hybrid II dummy has been found by NHTSA to be a satisfactory and objective test instrument. In sled and barrier tests conducted by GM with the GM restraint systems and in sled tests conducted by Calspan Corp. on behalf of NHTSA, the Hybrid II has produced results that are consistent and repeatable. This is not to say that each test at the same nominal speed and deceleration has produced identical values.

In testing with impact sleds, and to an even greater extent with crash-tested vehicles, the test environment itself is complex and necessarily subject to variations that affect the results. The test data show, however, that the variance

from dummy to dummy in these tests is sufficiently small that a manufacturer would have no difficulty in deciding whether his vehicle would be likely to fail if tested by NHTSA.

The provisions of the dummy regulation have been modified somewhat from those proposed in the notice of proposed rulemaking, largely as a result of comments from GM. Minor corrections have been made in the drawings and materials specifications as a result of comments by GM and the principal dummy suppliers. The dummy specification, as finally adopted, reproduces the Hybrid II in each detail of its design and provides, as a calibration check, a series of performance criteria based on the observed performance of normally functioning Hybrid II components. The performance criteria are wholly derivative and are intended to filter out dummy aberrations that escape detection in the manufacturing process or that occur as a result of impact damage. The revisions in the performance criteria, as discussed hereafter, are intended to eliminate potential variances in the test procedures and to hold the performance of the Hybrid II within the narrowest possible range.

General Motors suggested the abandonment of the definition of "upright position" in section 572.4(c), and the substitution of a set-up procedure in section 572.11 to serve both as a positioning method for the performance tests and as a measurement method for the dummy's dimensions as shown in the drawings. The NHTSA does not object to the use of an expanded set-up procedure, but has decided to retain the term "upright position" with appropriate reference to the new section 572.11(i).

The structural properties test of section 572.5(c), which had proposed that the dummy keep its properties after being subjected to tests producing readings 25 percent above the injury criteria of Standard No. 208, has been revised to provide instead that the properties must be retained after vehicle tests in accordance with Standard No. 208.

The head performance criteria are adopted as proposed. The procedures have been amended to insure that the forehead will be oriented below the nose prior to the drop, to avoid interference from the nose. In response to comments by the Road Research Laboratory, American



Motors, and GM, an interval of at least 2 hours between tests is specified to allow full restoration of compressed areas of the head skin.

The neck performance criteria are revised in several respects, in keeping with GM's recommendations. The pendulum impact surface, shown in Figure 4, has been modified in accordance with GM's design. The zero time point has been specified as the instant the pendulum contacts the honeycomb, the instructions for determining chordal displacement have been modified, and the pulse shape of the pendulum deceleration curve has been differently specified. The maximum allowable deceleration for the head has been increased slightly to 26g. In response to suggestions by the Road Research Laboratory and the Japan Automobile Manufacturers Association (JAMA), as well as GM, a tolerance has been specified for the pendulum's impact velocity to allow for minor variances in the honeycomb material.

With respect to the thorax test, each of the minor procedural changes requested by GM has been adopted. As with the head, a minimum recovery time is specified for the thorax. The seating surface is specified in greater detail, and the test probe orientation has been revised to refer to its height above the seating surface. The test probe itself is expressly stated to have a rigid face, by amendment to section 572.11, thereby reflecting the probes actually used by NHTSA and GM. A rigid face for the probe was also requested by Mercedes Benz.

The test procedures for the spine and abdomen tests are specified in much greater detail than before, on the basis of suggestions by GM and others that the former procedures left too much room for variance. The test fixtures for the spinal test orientation proposed by GM, and its proposed method of load application have been adopted. The parts of the dummy to be assembled for these tests are specifically recited, and an initial 50° flexion of the dummy is also specified. The rates of load application and removal, and the method of taking force readings are each specified. The direction of force application is clarified in response to a comment by Volvo.

The abdomen test is amended with respect to the initial point of force measurement, to re-

solve a particular source of disagreement between GM's data and NHTSA's. The boundaries of the abdominal force-deflection curve are modified to accord with the measurements taken by GM subsequent to the issuance of the notice. The rate of force application is specified as not more than 0.1 inch per second, in response to comments by Mercedes Benz, JAMA, and GM.

The test procedures for the knee tests are revised to specify the type of seating surface used and to control the angle of the lower legs in accordance with suggestions by JAMA, the Road Research Laboratory, and GM. The instrumentation specifications of section 572.11 are amended to clarify the method of attachment and orientation of the thorax accelerometers and to specify the channel classes for the chest potentiometer, the pendulum accelerometer, and the test probe accelerometer, as requested by several comments.

The design and assembly drawings for the test dummy are too cumbersome to publish in the *Federal Register*. During the comment period on the April 2 notice, the agency maintained master copies of the drawings in the docket and placed the reproducible mylar masters from which the copies were made with a commercial blueprint facility from whom interested parties could obtain copies. The NHTSA has decided to continue this practice and is accordingly placing a master set of drawings in the docket and the reproducible masters for these drawings with a blueprint facility.

The drawings as adopted by this notice differ only in minor detail from those that accompanied the April 2 notice. The majority of the changes, incorporated into corrected drawings, have already been given to those persons who ordered copies. The letter of June 13, 1973, that accompanied the corrected drawings has been placed in the docket. The June corrections are incorporated into the final drawing package. Additional adjustments are made hereby to reflect better the weight distribution of separated segments of the dummy, to allow other materials to be used for head ballast, and to specify the instrument for measuring skin thickness. The details of these changes are recited in a memorandum incorporated into the drawing package.



Each of the final drawings is designated by the legend "NHTSA Release 8/1/73". Each drawing so designated is hereby incorporated as part of the test dummy specifications of 49 CFR Part 572. Subsequent changes in the drawings will not be made without notice and opportunity for comment.

The incorporation of the Part 572 test dummy into Standard No. 208 makes obsolete several test conditions of the standard that had been adopted to supplement the former test dummy specifications. The location, orientation, and sensitivity of test instrumentation formerly specified by sections S8.1.15 through S8.1.18 are now controlled by Part 572 and are no longer necessary within Standard No. 208. Similarly, the use of rubber components for the head, neck and torso joints as specified in Part 572, supplant the joint setting specifications for those joints in section S8.1.10 of the standard. The NHTSA has determined that the deletion of the above portions of the Standard No. 208 will have no effect on the substantive requirements of the standard and that notice and public procedure thereon are unnecessary.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by the revision of Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208). . . .

In view of the pressing need for a test dummy to permit the continued development of passive restraint systems, and the fact that it presently only relates to a new option for compliance, the NHTSA finds that there is good cause to adopt an immediate effective date. Accordingly, Part 572 is effective August 1, 1973, and the amendment to Standard 208 is effective August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, P.L. 89-563, 15 U.S.C. 1392, 1407, and the delegation of authority at 38 F.R. 12147.

Issued on July 26, 1973.

James E. Wilson  
Associate Administrator  
Traffic Safety Programs

**38 F.R. 20449**  
**August 1, 1973**

## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208**

### **Occupant Crash Protection**

**(Docket No. 69-7; Notice 29)**

The purpose of this notice is to postpone the effective date of the requirements of Standards No. 208, Occupant Crash Protection, and 216, Roof Crush Resistance, applicable to the upcoming model year, from August 15, 1973 to September 1, 1973.

The amendment of the effective date was proposed in a notice published July 17, 1973 (38 F.R. 19049), in response to a petition filed by Chrysler Corporation. Chrysler had stated that the build-out of their 1973 models was in danger of running beyond the August 15 date, due to a variety of factors beyond the company's control. In proposing the postponement of the date, the NHTSA noted that the August 15 date had been chosen to coincide with the normal changeover date and that a delay would not appear to have any effect beyond allowing a slightly prolonged build-out.

The two comments submitted in response to the proposal were both favorable. The agency has not discovered any adverse consequences of a delay which would make it inadvisable, and

has therefore decided to postpone the effective date as proposed.

In light of the foregoing, 49 CFR 571.208, Standard No. 208, Occupant Crash Protection, is amended by changing the date of August 14, 1973, appearing in S4.1.1 to August 31, 1973, and by changing the date of August 15, 1973, appearing in S4.1.2 to September 1, 1973. The effective date of 49 CFR 571.216, Standard No. 216, Roof Crush Resistance, is changed from August 15, 1973, to September 1, 1973.

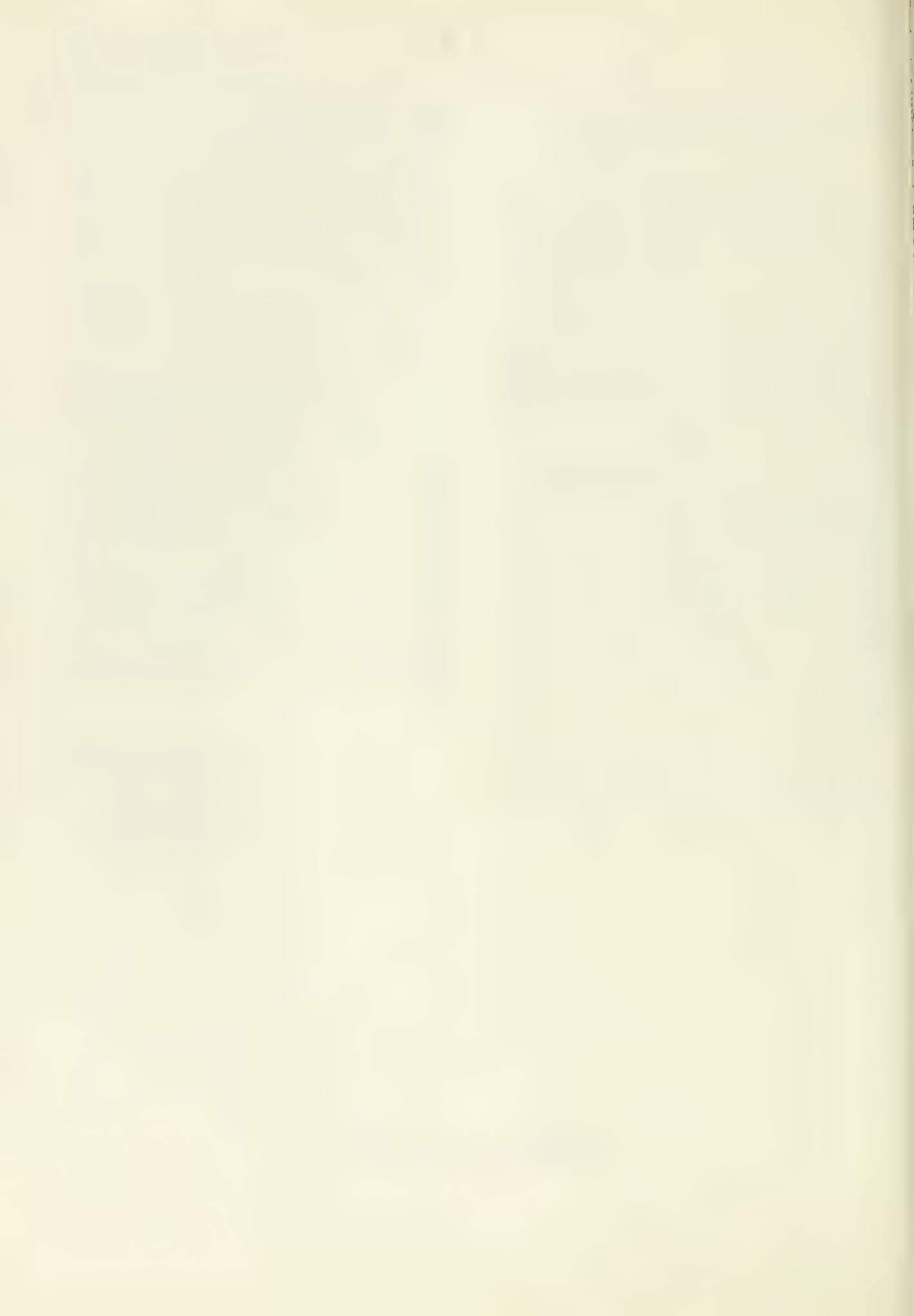
Because this amendment relieves a restriction and imposes no additional burden, an effective date of less than 30 days from the date of issuance is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 10, 1973.

James B. Gregory  
Administrator

**38 F.R. 21930  
August 14, 1973**





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection

(Docket No. 73-24; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to permit determination of the maintenance schedule for crash deployed occupant protection systems by reference to vehicle mileage and year and date of vehicle manufacture. The amendment responds to a rulemaking petition submitted by General Motors on May 21, 1973.

The present procedure for determining maintenance necessitates a change in labels each month. The two new methods published in a notice of proposed rulemaking on October 24, 1973 (38 F.R. 29341), avoid the label change and are phrased in typical warranty terms familiar to consumers. All comments received were in favor of the proposal and the standard is being amended accordingly.

In consideration of the foregoing, S4.5.1 of Motor Vehicle Safety Standard No. 208, *Occu-*

*pant crash protection*, 49 CFR 571.208, is amended. . . .

*Effective date:* January 10, 1974. Because the amendment relaxes a requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 3, 1974.

James B. Gregory  
Administrator

**39 F.R. 1513**  
**January 10 1974**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 74-4; Notice 2)**

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, by specifying emergency and special release requirements for seat belt assemblies that require no action by vehicle occupants (passive belts). This notice also sets out procedures for determination of whether a belt assembly qualifies as a passive restraint system in accordance with an interpretation published May 4, 1971 (36 F.R. 4600).

The passive belt release mechanism was proposed to grant a petition for rulemaking by Volkswagenwerk Aktiengesellschaft and Volkswagen of America, Inc. directed toward introduction of its passive belt system in its 1975 model cars (39 F.R. 3834, January 30, 1974). The proposed release mechanism, which reflects comments to an earlier proposal on release from passive belt systems (36 F.R. 12866, July 8, 1971) consists of a push-button latch release, guarded by a warning buzzer and interlock.

With the exception of Britax, Ltd., all comments favored a requirement for a manual release mechanism in passive belt systems, although most comments suggested changes in the proposal. One comment addressed to the adequacy of the Volkswagen belt system apparently did not understand that any passive belt system must meet the same injury criteria as any other passive system.

Britax pointed out the possibility of abuse of the manual release mechanism, but the NHTSA has concluded that the advantages of a release mechanism, as discussed in Notice 1, outweigh the disadvantages of possible abuse. The temptation to defeat the passive belt is less than it is with active belts, because the vehicle starts with the least inconvenience when the belt is permitted to work correctly.

The American Safety Equipment Corporation suggested that lever or pull-knob action would be a more satisfactory release mechanism than the push-button for occupants who only use the release infrequently and in emergency situations. There is a considerable advantage in uniformity, however, for those who do not normally use passive belt systems. The NHTSA specifies push-button action for all belt systems so that persons familiar with any belt system in any vehicle can operate the belt system of an unfamiliar vehicle. A person who operates typical 3-point active belts in his own car should be able to use the same push-button release action when he is a guest in a passive-belt equipped vehicle.

Manufacturers suggested several changes in the specifications for the warning buzzer and interlock guarding mechanism. American Motors recommended that the manufacturer be able to select either a starter interlock or the alternative power train interlock which has been proposed by the NHTSA. While there appear to be no disadvantages in such an option, the interlock requirements need not be changed until the NHTSA has acted on the alternative interlock proposal.

As proposed, the guarding features would operate if the release mechanism were unfastened. The Japan Automobile Manufacturers Association suggested addition of the option available in sequential interlocks, which operates the features if the belt length on the retractor indicates that the belt is not properly deployed. Such an option would be inappropriate, however, where there were no sequential system, because it would permit easy and permanent defeat of the system by knotting the belt after it had once been drawn from the retractor.



The proposal would have added a reference in S4.1.2.2 to the S4.5.3 passive belt exception in order to clarify their relationship. General Motors stated that, in actuality, the reference confused the relationship of S4 and S4.5.3 by implying that the S4.5.3 exception is limited to S4.1.2.2. The proposed addition will not be made.

Volkswagen suggested a clarification of the S7.2(b) latch mechanism requirement to remove the implication that a lap belt is required with the upper torso restraint, and this change has been made.

Volkswagen, in a March 8, 1974, letter request for interpretation, and General Motors in its comments, addressed the broad question of what constitutes a "passive" restraint system—one that requires "no action by vehicle occupants"—as those concepts are used in Standard No. 208. The NHTSA published an interpretation of what constitutes a "passive" restraint system on May 4, 1971 (36 F.R. 4600):

The concept of an occupant protection system that requires "no action by vehicle occupants" as used in Standard No. 208 is intended to designate a system that requires no action other than would be required if the protective system were not present in the vehicle.

The NHTSA responded to Volkswagen's request with a letter further interpreting this concept as follows:

The question of what constitutes "no action by vehicle occupants" in a vehicle equipped with (presumptively) passive belts is best considered in two stages: (1) entry and exit from the vehicle, and (2) positioning of the belt for safety and comfort.

Entry and exit action "that requires no action other than would be required if the protective system were not present in the vehicle" means that a person is not hampered in his normal movements by the presence of the belt system. A test of this is whether a human occupant of approximately the dimensions of the 50th percentile adult male finds it necessary to take additional actions to displace the belt or associated components in order to enter or leave the seating

position in question. An example of impermissible action would be the necessity of manually pushing a belt out of the way to gain access to the seat. Displacement of the components incidental to entry and exit, or merely for the convenience of the occupant would not be prohibited. Examples of permissible displacement would be brushing against the upper torso restraint during seating, or grasping the torso restraint to close the door.

The second question relates to the usefulness of the system once the occupant has been seated. The essence of a passive restraint is that it provides at least the minimum level of protection without relying on occupant action to deploy the restraint. At this stage, then, the question is whether an occupant who has seated himself without taking any "additional action" is in fact protected in a 30 mi/h impact. This can be measured by conducting the impact tests with the belt positioned on the test dummy in the orientation that results when a human occupant enters the vehicle according to the first test described above. It would not be required that the belt position itself for maximum comfort of the human occupant, if it met the safety requirements. For example, if the belt were to fall across the upper arm instead of the clavicle, but still passed the test, the system would be considered conforming.

The procedure for conducting this evaluation would be to have a human occupant enter the vehicle without taking any "additional actions" to displace the belt, to note the location of the belt on him before he exits, to position the test dummy in accordance with S8.1 of Standard 208, to position the belt as it positioned itself on the sample occupant, and then to conduct the impact tests. The exit evaluation would require the human occupant to be seated with the restraint normally deployed and then exit the vehicle without needing to take any separate actions to displace the belt.

In light of this interpretation, the NHTSA does not believe additional specification is required in the standard as requested by General Motors.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

*Effective date:* May 27, 1974. On the basis of a determination that it is in the public interest to permit the introduction of a passive belt system concurrently with the 1975 passenger car model changes, it is found for good cause shown that an effective date earlier than 180 days following the date of issuance of this amendment is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on April 22, 1974.

James B. Gregory  
Administrator

**39 F.R. 14593**

**April 25, 1974**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 74-39; Notice 1)**

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, by eliminating the ignition interlock. Parallel changes are made to the passive seat belt provisions (S4.5.3) and the seat belt assembly requirements (S7.) of the standard.

This amendment is responsive to recently-enacted legislation which prohibits, after February 25, 1975, any Federal motor vehicle safety standard that requires or provides for use of a safety belt interlock system or a "continuous buzzer" warning. Pub. L. 93-492; § 109 (Oct. 28, 1974). The legislation further specifies that lap and shoulder belt assemblies shall be installed until the NHTSA undertakes further rulemaking on alternative systems. The NHTSA concludes that immediate action to delete the interlock option conforms to the intent of the legislation. Accordingly, S4.1.2.3, S4.5.3, and S7.4 have been modified as necessary to specify seat belt assemblies without an interlock that inhibits operation of the vehicle engine.

The legislation does not list the exact specifications of the warning system which will replace the "continuous buzzer" after 120 days, but it restricts the buzzer portion of any future warning to an 8-second period following operation of the ignition. Because the legislation leaves considerable regulatory discretion concerning warning systems, and a new system may require

components not presently in manufacturers' inventories, the NHTSA finds it necessary and desirable to propose the new requirements in a separate notice, permitting opportunity for consideration and submission of comments by interested persons. Final action will be taken by December 27, 1974, to specify a new warning system as required by the statute.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

*Effective date:* October 29, 1974. Because this amendment relieves a restriction and responds to a Congressional mandate expressed in the Motor Vehicle and Schoolbus Safety Amendments of 1974, the National Highway Traffic Safety Administration finds, for good cause shown, that notice and public procedure hereon are impracticable and unnecessary, and that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 109, 111 Pub. L. 93-492; delegation of authority at 49 CFR 1.51.)

Issued on October 29, 1974.

James B. Gregory  
Administrator

**39 F.R. 38380**  
**October 31, 1974**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection

(Docket No. 74-39; Notice 3)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to establish a new warning system for seat belt assemblies to replace the present warning system after February 24, 1975. The new system is permitted as an alternative to the present requirements until February 24, 1975.

This amendment responds to recently-enacted legislation which prohibits, after February 24, 1975, any Federal motor vehicle safety standard that requires or provides for use of a safety belt interlock or a "continuous buzzer" warning. Pub. L. 93-492; § 109, October 27, 1974 (15 U.S.C. § 1410(b)). An earlier amendment of the standard revoked the interlock option (39 F.R. 38380, October 31, 1974). In prohibiting the "continuous buzzer", the legislation states that an acceptable buzzer would operate only during an 8-second period after the ignition is turned to the "start" or "on" position. The legislation placed no restriction on warning lights. The present warning system provisions in Standard No. 208 do not comply with the legislative limit on "continuous buzzers".

On October 29, 1974, the NHTSA proposed a modified warning that would consist of a continuous or flashing reminder light that operates only during the 4- to 8-second period after the ignition is operated, and a continuous or intermittent audible warning signal which operates only during the 4- to 8-second period after the ignition is operated if the driver's lap belt is not in use (39 F.R. 38391, October 31, 1974). The light would operate independently of belt use, so that the "Fasten Seat Belt" reminder would remain effective even if the belt were disabled to silence the audible warning. With a view to cost-effectiveness, the NHTSA proposed two other alternative courses of action. The

first would require only a visual reminder signal as described above and the second would eliminate entirely requirements for belt-use warning or reminder systems.

The notice proposed that the new system be optional until February 25, 1975, so that a manufacturer could effectuate the transition on an orderly basis.

The comments received varied greatly in their recommendations on the principal proposal, the visual-only alternative, and the possibility of no warning system requirements at all. Ford believed that the limited duration of the warning would make it relatively ineffective, and that deleting the belt warning requirements would have the best overall effect on public acceptance of seat belts. General Motors supported a visual-only reminder, and proposed an optional means of providing that visual reminder. Chrysler Corporation argued for a more complex warning system that would sense belt use at the right front passenger position as well as the driver's position, and would include a continuous warning light in place of the 4- to 8-second visual reminder. Volkswagen supported the audible-visual combination but recommended that both signals act as a reminder and function independently of belt use.

Smiths Industries Limited, a manufacturer of interlock units, Economics and Science Planning, and Switches, Inc., recommended that the sequential warning feature remain as an added incentive to operate the belt system. Other comments completely supported or opposed the proposal and in some cases offered totally new suggestions.

The NHTSA has carefully weighed the comments submitted in order to specify the most reasonable belt warning system requirements



available. NHTSA studies show that belt usage by front seat occupants of interlock-equipped cars currently is about 38 percent. If from this percentage is subtracted the percentage of persons who would fasten their seat belts regardless of forcing systems, it can be seen that the fraction of the population whose behavior will be affected by any warning system is quite small. Because of the limited benefit, the reminder should be provided at as low a cost as feasible.

Because an irritating light can be easily ignored or disabled, a visual signal can effectively serve only a reminder function, and as such, it should be as simple as possible. The NHTSA concludes that a 4- to 8-second reminder is best calculated to accomplish the advisory function.

Chrysler recommended that the warning and reminder system be installed at the right front passenger position, which would add significant retractor or buckle switch, wiring, and seat sensor costs. The NHTSA calculates that the driver's warning system (or belt use) will offer substantially the same reminder to a front seat passenger as a limited-duration signal at the passenger position.

The Administration has determined that an audible-visual combination will provide the best reminder at a cost commensurate with the benefits achievable in a limited-duration signal. Comments on the alternative proposals and on manufacturer-suggested options did not establish that variations on the principal proposal offered significantly greater safety benefit in the short or long term. Accordingly, Standard No. 208 is amended as proposed to adopt a new belt warning system, as an alternative to the present system until February 24, 1975, and as the only permissible belt warning system thereafter.

With regard to the warning's duration, Ford suggested that the range of signal duration be expanded to a longer 2- to 8-second duration to permit use of a more economical timer. This request is denied. The 4-second minimum duration was selected as the best compromise between the necessary manufacturer's tolerance and the duration necessary to alert the occupants fully.

Some manufacturers, such as American Motors Corporation, have considered the use of thermal timer mechanisms, which can be affected by extremes of ambient temperature and battery voltage, and by repeated cycling. Standard No. 208 does not presently specify an ambient temperature for testing. Because no temperature was proposed, and in view of the necessity of specifying a warning system to comply with the legislation by December 26, 1974, the NHTSA will issue the present amendment without an ambient temperature test condition. Until the question of the need for a temperature specification is resolved, this agency will consider that compliance with the requirements is required at moderate ambient temperatures. Performance of these systems will be observed with a view to further rulemaking on temperature, cycling, and other criteria.

It should be noted that the February 25, 1975, date proposed for mandatory use of the new system was calculated on an October 28, 1974, enactment of the "Motor Vehicle and Schoolbus Safety Amendments of 1974". In fact these amendments were enacted on October 27, 1974, and accordingly the "continuous buzzer" systems must be deleted by February 24, 1975, as is now reflected in the wording of this amendment.

In another area, White Motor Company has pointed out that the amendatory language in both notices of Docket No. 74-39 inadvertently included motor vehicles other than passenger cars in the belt warning requirement. The wording of this amendment corrects this error as to vehicles manufactured in the future. The requirements of S7.3 published in the Federal Register on October 31, 1974 (39 F.R. 38380) were intended to apply, and will be treated by this agency as applying, only to motor vehicles manufactured in accordance with S4.1.2 and S4.1.3.

In a matter related to seat belt modifications, the NHTSA hereby terminates rulemaking on a proposal to amend Standard No. 208 that would have permitted use of a drive train interlock mode in place of the ignition interlock

mode to meet the "third option" belt interlock requirements of S4.1.2.3. A proposal on this alternative interlock was published January 23, 1974 (39 F.R. 2610). As noted earlier, the NHTSA has already modified S4.1.2.3 of the standard to specify seat belt assemblies without an interlock that inhibits operation of the vehicle engine. For this reason, it is appropriate to terminate further rulemaking on the alternative interlock mode. No further action in this area will be taken without further notice and opportunity for comment.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

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*Effective date:* December 3, 1974.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 109, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1410(b)); delegation of authority at (49 CFR 1.51).

Issued on December 2, 1974.

James B. Gregory  
Administrator

**39 F.R. 42692**

**December 6, 1974**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 75-14; Notice 2)**

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to permit until January 1, 1976, the installation of current seat belt assemblies in trucks and multipurpose passenger vehicles (MPV) with a gross vehicle weight rating of 10,000 pounds or less. This amendment was proposed (40 F.R. 23897, June 3, 1975) in response to petitions from Chrysler Corporation and Jeep Corporation.

In both the Jeep and Chrysler petitions and in comments on the proposal, vehicle manufacturers stated that the current economic situation may cause the continued production of 1975-model vehicles beyond August 15, 1975, after their production would normally have been terminated. Significant cost in obsolete material and in running changes would be involved in the introduction of the new 3-point belt systems in vehicles which are designed to accept lap belts only.

Ford Motor Company concurred in the proposal in view of obsolescence costs which might be avoided by the 4-month option. General Motors Corporation only indicated that it did not object to the proposal. The American Safety Belt Council emphasized the readiness of seat belt manufacturers to supply the new systems and the importance of a swift decision. They expressed support for the introduction of 3-point systems as soon as possible. The Recreational Vehicle Industry Association sought confirmation of its understanding that the proposal did not modify requirements for motor homes and forward control vehicles under S4.2. (RVIA's understanding is correct.) Chrysler and Jeep supported the proposal, and Jeep supplied production and retail cost information for which it requested confidentiality.

It is apparent from the nature of data submitted by manufacturers that the 20-day comment period did not allow adequate time for collection and development of the items enumerated in the preamble to the proposal. While it would be preferable to provide manufacturers more time to develop additional data, the NHTSA recognizes that virtually no time remains in which to make decisions for August 1975 production. The cost data already submitted by Jeep and the engineering changes submitted by Chrysler do permit an NHTSA judgment on cost objections of manufacturers under § 113 and on the advisability of the proposed modification.

Using the Chrysler submission as representative of the production changes to be undertaken by any manufacturer in effecting a running change to the seat belt systems of the 1975-model vehicles built after August 14, 1975, it is concluded that the total cost implications of these changes would be substantial if undertaken. The Jeep itemized cost information on production changes bore out this conclusion. In terms of obsolescence, it is confirmed by Ford that the decreased sales will result in obsolescence due to inability to balance out stocks of seat belts and other components in 1975-model vehicles.

Pursuant to § 113(b)(1) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1402(b)(1)), the information on which this evaluation is based is available in the NHTSA public docket (Docket No. 75-14, Notice 1; PRM #208-000022; PRM #105-000019) except for the Jeep submission. The NHTSA is presently determining whether the submission is entitled to confidential treatment. If it is not, the submission will be placed in Docket No. 75-14, Notice 1.

In all, the information submitted by manufacturers, particularly Chrysler, indicates that a substantial number of changes would be required to effect a running change to the vehicles in question after August 15, 1975. The cost data submitted by Jeep indicate that these changes will result in significant cost increases. The NHTSA has decided that the significant costs of the running changes in 1975-model vehicles whose production may be continued after August 15, 1975, are not justified for the numbers of vehicles that might be affected.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

*Effective date:* July 9, 1975. Because this amendment concerns production decisions that

must be made immediately for the model changes in September 1975, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on July 3, 1975.

James B. Gregory  
Administrator

**40 F.R. 28805**  
**July 9, 1975**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 74-14; Notice 4)**

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to continue until August 31, 1976, the present three options available for occupant crash protection in passenger cars. This amendment replaces provisions of the standard which were to have come into effect on August 15, 1975, but were suspended as a result of the decision of the U.S. Court of Appeals for the Sixth Circuit in *Chrysler v. DOT*, 472 F2d 659 (6th Cir. 1972).

This extension of the present occupant crash protection options was proposed April 10, 1975 (40 F.R. 21617). Vehicle manufacturers and the American Safety Belt Council (ASBC) supported the proposal, but requested that the modifications apply indefinitely instead of being limited to a 1-year extension. Ford Motor Company, Chrysler Corporation, and Volkswagen of America also asked that the future provisions for light trucks and multipurpose passenger vehicles (MPV) (S4.2.3) be similarly modified. The California Traffic Safety Foundation and the Vehicle Equipment Safety Commission supported the proposal but only for the 1-year period for which it was proposed.

While the NHTSA recognizes that the present crash protection options will in all likelihood be in effect for some period after August 31, 1976, the agency has not proposed more than the 1-year extension. The Administrative Procedures Act specifies, with limited exceptions, that

notice and opportunity to comment be provided interested persons in the case of agency rule-making proceedings (§ 553(b)). The NHTSA intends to propose the long-term requirements for occupant crash protection, both for passenger cars and for light trucks and MPV's, as soon as possible.

Until that time, the NHTSA finds that manufacturers must be assured of the regulations for occupant crash protection as they apply to upcoming production. In consideration of the foregoing, Standard No. 208 (49 CFR § 571.208) is amended. . . .

*Effective date:* August 13, 1975. Because the present requirements for occupant crash protection terminate in less than 30 days and manufacturers need to be advised of the continuation of the requirements as soon as possible, it is found for good cause shown that an effective date sooner than 30 days following the date of publication is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on August 8, 1975.

James B. Gregory  
Administrator

**40 F.R. 33977**  
**August 13, 1975**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 75-33; Notice 2)**

This notice amends Standard No. 208, *Occupant Crash Protection*, to permit certain U.S. Postal Service vehicles to meet the requirements of the standard that were in effect until January 1, 1976, instead of the new requirements that became effective on that date.

The NHTSA proposed this modification of Standard No. 208 (49 CFR 571.208) in a notice published December 31, 1975 (40 FR 60075). The occupant protection requirements in the standard until January 1, 1976, specified either a Type 1 or Type 2 seat belt assembly at the driver's position of the light delivery vehicles used by the Postal Service on delivery routes. The Postal Service's safety research organization developed a seat belt design that met the requirements and resulted in improved usage by vehicle operators.

The newer requirements now in effect for the light delivery vehicles in question require the same seat belt assembly installations as in most passenger cars, including a Type 2 seat belt assembly with non-detachable shoulder belt at each front outboard designated seating position. The Service judges that installation of Type 2 seat belts at the driver's position with non-detachable shoulder portion will decrease the percentage of seat belt use by their mail delivery personnel.

The Postal Service indicated its support for the proposal. Ford Motor Company objected to the basis of the vehicle category as a "single user exemption." The agency, while in agreement that categorization based on the status of a single user is not generally utilized, recognizes the dis-

tinctive scope and nature of U.S. Postal Service operations. The Service is a part of the Federal government, its delivery activities are unique in scope and variety, and the organization has an active safety research effort that addresses the particular environment of mail delivery by motor vehicle. No other comments were received. The agency concludes that the new requirements for Type 2 seat belt assemblies at the driver's position in this limited category of vehicle are not justified, because their interference with the many entries and exits from the vehicle may discourage usage.

In consideration of the foregoing, S.4.2.2 of Standard No. 208 (49 CFR 571.208) is amended by the addition of the phrase "vehicles designed to be exclusively sold to the U.S. Postal Service," following the phrase "motor homes."

*Effective date:* March 18, 1976. Because this amendment creates no additional requirements for any person, and in view of the Postal Service's need to contract for vehicles with appropriate seat belt assemblies at the earliest opportunity, an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on March 10, 1976.

James P. Gregory  
Administrator

**41 F.R. 11312**  
**March 18, 1976**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 74-14; Notice 6)**

This notice amends Standard No. 208, Occupant Crash Protection, to continue until August 31, 1977, the present three options available for occupant crash protection in passenger cars.

This extension of the present occupant crash protection options of Standard No. 208 (49 CFR 571.208) was proposed July 19, 1976 (41 FR 29715), along with several other subjects that will be the subject of a future notice. Vehicle manufacturers supported the proposal but requested that the options be extended indefinitely instead of being limited to a 1-year extension. Mr. Benjamin Redmond advocated the use of an interlock system to increase usage of active belt systems. Ms. Lucie Kirylak expressed a preference for active occupant crash protection systems. The National Motor Vehicle Safety Advisory Council did not take a position on the proposal.

The Secretary of Transportation has initiated a process for the establishment of future occupant crash protection requirements under Standard No. 208 (41 FR 24070, June 14, 1976). The Secretary's proposal addresses the long term issues involved, and this 1-year extension of requirements is intended to provide the time necessary to reach that decision. Because a 1-year extension is consistent with the process that has been established and because a longer extension was not proposed for comment, the NHTSA declines to extend the existing requirements as recommended by the manufacturers.

Other matters proposed in the notice that underlies this action will be treated at a later

date, following the receipt of comments that are due on October 20, 1976.

The NHTSA notes that no effective date was proposed for the other matters addressed by the proposal. Those matters involve modification of the existing passive protection options so that they conform to the proposal of the Department of Transportation, and to reduce somewhat the femur force requirement. Also, further specification of dummy positioning in the vehicle was addressed. The agency proposes an immediate effective date for these changes, because they represent relaxation of the requirements. However, the views of interested persons, particularly Volkswagen (which is certifying compliance under one passive option), are solicited by October 20, 1976.

In consideration of the foregoing, the heading and text of S4.1.2 of Standard No. 208 (49 CFR 571.208) are amended by changing the date "August 31, 1976" to "August 31, 1977" wherever it appears.

*Effective date:* August 26, 1976.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 26, 1976.

John W. Snow  
Administrator

**41 F.R. 36494**  
**August 30, 1976**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

## Occupant Crash Protection

(Docket No. OST 44; Notice 77-3)

This notice amends Standard No. 208, *Occupant Crash Protection*, to extend indefinitely the current occupant crash protection requirements for passenger cars.

In a notice published June 14, 1976 (41 FR 24070), I proposed five alternative courses of action for future occupant crash protection requirements under Standard No. 208 (49 CFR 571.208). Based on an analysis of comments received, a decision was reached to call upon the automobile manufacturers to join the Federal government in conducting a large-scale demonstration program to exhibit the effectiveness of passive restraint systems. The reasoning that underlines that decision is contained in a December 6, 1976, document ("The Secretary's Decision Concerning Motor Vehicle Occupant Crash Protection") that is hereby incorporated by reference in this notice. The effect of that decision on Standard No. 208 is to require the continuation of the current requirements for passenger cars, as proposed in the first of the five alternative courses of action.

The first alternative was written as a three-year extension (to August 31, 1979), although the preamble discussion made clear that the length of the extension was open to discussion. It is now apparent that a continuation of the existing requirements is best effectuated by a deletion of any termination date. This action accords with the intent of the first alternative to maintain current occupant crash protection requirements for the indefinite future. Because this action represents a continuation of existing manufacturing practices, it is the Department's finding that no new significant economic or environmental impacts result from this amendment.

I have directed the National Highway Traffic Safety Administration (NHTSA) to propose comparable changes in the requirements for multipurpose passenger vehicles and light trucks. The NHTSA has also been directed to take final action on the substantive changes to Standard No. 208 that were proposed in its notice of July 19, 1976 (41 FR 29715).

The Department hereby closes OST Docket No. 44, which is transferred to the NHTSA's docket on occupant crash protection. I want to make it clear, however, that by closing OST Docket No. 44 and amending Standard No. 208 to extend indefinitely the current occupant crash protection requirements for passenger cars, I have not in any way foreclosed a future Secretary or Administrator of NHTSA from instituting at any time a rulemaking to amend Standard No. 208 either to place a terminate date on Standard No. 208 or to mandate passive restraints on some or all passenger cars.

In consideration of the foregoing, the heading and text of S4.1.2 of Standard No. 208 (49 CFR 571.208) are amended in part to read as follows:

S4.1.2 *Passenger cars manufactured on or after September 1, 1973.* Passenger cars manufactured on or after September 1, 1973, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3. \* \* \*.

*Effective date:* January 19, 1977.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407).)

Issued on January 19, 1977.

William T. Coleman, Jr.  
Secretary of Transportation  
42 F.R. 5071  
January 27, 1977





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection

(Docket No. 74-14; Notice 9)

This notice amends Standard No. 208, *Occupant Crash Protection*, to extend indefinitely the current occupant crash protection requirements for light trucks and multipurpose passenger vehicles. The question of future requirements for occupant crash protection is presently being considered by the Secretary of Transportation, and thus the current requirements for light trucks and multipurpose passenger vehicles should be continued for the indefinite future.

Effective date: June 2, 1977.

Addresses: Requests for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Guy Hunter  
Motor Vehicle Programs  
National Highway Traffic Safety  
Administration  
Washington, D.C. 20590  
(202-426-2265)

The requirements of Standard No. 208 (49 CFR 571.208) have been implemented in three stages. The current stage for trucks and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less specifies a choice of three means to provide occupant protections (S4.2.2) and is scheduled to end August 14, 1977. After that date many of these vehicles would be required by S4.2.3 of Standard No. 208 to provide occupant crash protection by means that require no action by vehicle occupants (commonly known as passive protection). In the original promulgation of Standard No. 208 in its present form (36 FR

4600; March 10, 1971) it was established that this modification of occupant protection should follow a similar modification of protection in passenger cars by two years, to provide manufacturers with time to assimilate and benefit from passenger car experience.

The issue of future occupant protection in passenger cars is being decided at this time, in a notice of proposed rulemaking issued by the Secretary of Transportation (42 FR 15935; March 24, 1977). Thus, light truck and MPV manufacturers have not had the benefit of experience with new systems in passenger cars as originally anticipated. In view of this fact and the fact that they are not prepared to meet requirements other than the existing performance options after August 14, 1977, the agency has decided to continue the existing requirements indefinitely.

This action does not preclude future rulemaking to modify occupant crash protection for the affected vehicles, but notice and opportunity for comment will be provided prior to further action.

Because this action represents a continuation of existing manufacturing practices, it is the agency's finding that no new significant economic or environment impacts result from this amendment.

The lawyer principally responsible for the preparation of this document is Tad Herlihy of the NHTSA Office of Chief Counsel.

The economic and inflationary impacts of this rulemaking have been carefully evaluated in accordance with OMB Circular A-107, and an Inflation Impact Statement is not required.

In view of the fact that future occupant protection requirements are not established and manufacturers are prepared only to meet exist-

Effective: June 2, 1977

ing occupant protection requirements after August 1977, the agency finds that notice and public procedure on this amendment to continue existing requirements is unnecessary and contrary to the public interest in knowing next model year's requirements as soon as possible. The agency also finds that this amendment may become effective immediately, because the amendment relieves a restriction.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

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(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on May 27, 1977.

Joan Claybrook  
Administrator

**42 F.R. 28135**  
**June 2, 1977**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 74-14; Notice 11; Docket No. 73-8; Notice 7)**

This notice amends occupant crash protection Standard No. 208 and its accompanying test dummy specification to further specify test procedures and injury criteria. The changes are minor in most respects and reflect comments by manufacturers of test dummies and vehicles and the NHTSA's own test experience with the standard and the test dummy.

Date: Effective date July 5, 1978.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Mr. Guy Hunter  
Motor Vehicle Programs  
National Highway Traffic Safety  
Administration  
Washington, D.C. 20590  
(202) 426-2265

Supplemental information: Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), is a Department of Transportation safety standard that requires manufacturers to provide a means of restraint in new motor vehicles to keep occupants from impacting the vehicle interior in the event a crash occurs. The standard has, since January 1968, required the provision of seat belt assemblies at each seating position in passenger cars. In January 1972 the requirements for seat belts were upgraded and options were added to permit the provision of restraint that is "active" (requiring some action be taken by the vehicle occupant, as in the case of seat belts) or "passive" (providing protection without action being taken by the occupant).

In a separate notice issued today (42 FR 34289; FR Reg. 77-19137), the Secretary of

Transportation has reached a decision regarding the future occupant crash protection that must be installed in passenger cars. The implementation of that decision will involve the testing of passive restraint systems in accordance with the test procedures of Standard No. 208, and this notice is intended to make final several modifications of that procedure which have been proposed for change by the NHTSA. This notice also responds to two petitions for reconsideration of rulemaking involving the test dummy that is used to evaluate the compliance of passive restraint systems.

**DOCKET 74-14; NOTICE 05**

Notice 5 was issued July 15, 1976 (41 FR 29715; July 19, 1976) and proposed that Standard No. 208's existing specification for passive protection in frontal, lateral, and rollover modes (S4.1.2.1) be modified to specify passive protection in the frontal mode only, with an option to provide passive protection or belt protection in the lateral and rollover crash modes. Volkswagen had raised the question of the feasibility of small cars meeting the standard's lateral impact requirements: A 20-mph impact by a 4,000-pound, 60-inch-high flat surface. The agency noted the particular vulnerability of small cars to side impact and the need to provide protection for them based on the weight of other vehicles on the highway, but agreed that it would be difficult to provide passive lateral protection in the near future. Design problems also underlay the proposal to provide a belt option in place of the existing passive rollover requirement.

Ford Motor Company argued that a lateral option would be inappropriate in Standard No. 208 as long as the present dummy is used for measurement of passive system performance.

This question of dummy use as a measuring device is treated later in this notice. General Motors Corporation (GM) supported the option without qualification, noting that the installation of a lap belt with a passive system "would provide comparable protection to lap/shoulder belts in side and rollover impacts." Chrysler did not object to the option, but noted that the lap belt option made the title of S4.1.2.1 ("complete passive protection") misleading. Volkswagen noted that its testing of belt systems without the lap belt portion showed little loss in efficacy in rollover crashes. No other comments on this proposal were received. The existing option S4.1.2.1 is therefore adopted as proposed so that manufacturers will be able to immediately undertake experimental work on passive restraints on an optional basis in conformity with the Secretary's decision.

There were no objections to the agency's proposal to permit either a Type 1 or Type 2 seat belt assembly to meet the requirements, and thus it is made final as proposed.

The NHTSA proposed two changes in the injury criteria of S6 that are used as measures of a restraint system's qualification to Standard No. 208. One change proposed an increase in permissible femur force limits from 1,700 pounds to 2,250 pounds. As clarification that tension loads are not included in measurement of these forces, the agency also proposed that the word "compressive" be added to the text of S6.4. Most commenters were cautionary about the changes, pointing out that susceptibility to fracture is time dependent, that acetabular injury could be exacerbated by increased forces, and that angular applications of force were as likely in the real world as axial forces and would more likely fracture the femur.

The agency is aware of and took into account these considerations in proposing the somewhat higher femur force limit. The agency started with the actual field experience of occupants of GM and Volkswagen vehicles that have been shown to produce femur force readings of about 1,700 pounds. Occupants of these vehicles involved in crashes have not shown a significant incidence of femur fracture. The implication from this experience that the 1,700-pound figure can safely be raised somewhat is supported in

work by Patrick on compressive femur forces of relatively long duration. The Patrick data (taken with aged embalmed cadavers) indicate that the average fracture load of the patella-femur-pelvis complex is 1,910 pounds. This average is considered conservative, in that cadaver bone structure is generally weaker than living human tissue. While these data did not address angular force applications, the experience of the GM and Volkswagen vehicle occupants does suggest that angular force application can go higher than 1,700 pounds.

The agency does not agree that the establishment of the somewhat higher outer limit for permissible femur force loads of 2,250 pounds is arbitrary. What is often ignored by the medical community and others in commenting on the injury criteria found in motor vehicle safety standards is that manufacturers must design their restraint systems to provide greater protection than the criteria specified, to be certain that each of their products will pass compliance tests conducted by the NHTSA. It is a fact of industrial production that the actual performance of some units will fall below nominal design standards (for quality control and other reasons). Volkswagen made precisely this point in its comments. Because the National Traffic and Motor Vehicle Safety Act states that each vehicle must comply (15 U.S.C. § 1392(a)(1)(a)), manufacturers routinely design in a "compliance margin" of superior performance. Thus, it is extremely unlikely that a restraint system designed to meet the femur force load criterion of 2,250 pounds will in fact be designed to provide only that level of performance. With these considerations in mind, the agency makes final the changes as proposed.

While not proposed for change, vehicle manufacturers commented on a second injury criterion of the standard: A limitation of the acceleration experienced by the dummy thorax during the barrier crash to 60g, except for intervals whose cumulative duration is not more than 3 milliseconds (ms). Until August 31, 1977, the agency has specified the Society of Automotive Engineers' (SEA) "severity index" as a substitute for the 60g-3ms limit, because of greater familiarity of the industry with that criterion.



General Motors recommended that the severity index be continued as the chest injury criterion until a basis for using chest deflection is developed in place of chest acceleration. GM cited data which indicate that chest injury from certain types of blunt frontal impact is a statistically significant function of chest deflection in humans, while not a function of impact force or spinal acceleration. GM suggested that a shift from the temporary severity index measure to the 60g-3ms measurement would be wasteful, because there is no "strong indication" that the 60g 3ms measurement is more meaningful than the severity index, and some restraint systems might have to be redesigned to comply with the new requirement.

Unlike GM, Chrysler argued against the use of acceleration criteria of either type for the chest, and rather advocated that the standard be delayed until a dummy chest with better deflection characteristics is developed.

The Severity Index Criterion allows higher loadings and therefore increases the possibility of adverse effects on the chest. It only indirectly limits the accelerations and hence the forces which can be applied to the thorax. Acceleration in a specific impact environment is considered to be a better predictor of injury than the Severity Index.

NHTSA only allowed belt systems to meet the Severity Index Criterion of 1,000 instead of the 60g-3ms criterion out of consideration for lead-time problems, not because the Severity Index Criterion was considered superior. It is recognized that restraint systems such as lap-shoulder belts apply more concentrated forces to the thorax than air cushion restraint, and that injury can result at lower forces and acceleration levels. It is noted that the Agency is considering rule-making to restrict forces that may be applied to the thorax by the shoulder belt of any seat belt assembly (41 FR 54961; December 16, 1976).

With regard to the test procedures and conditions that underlie the requirements of the standard, the agency proposed a temperature range for testing that would be compatible with the temperature sensitivity of the test dummy. The test dummy specification (Part 572, *Anthropomorphic Test Dummy*, 49 CFR Part 572) con-

tains calibration tests that are conducted at any temperature between 66° and 78° F. This is because properties of lubricants and nonmetallic parts used in the dummy will change with large temperature changes and will affect the dummy's objectivity as a test instrument. It was proposed that the Standard No. 208 crash tests be conducted within this temperature range to eliminate the potential for variability.

The only manufacturers that objected to the temperature specification were Porsche, Bayerische Motoren Werke (BMW), and American Motors Corporation (AMC). In each case, the manufacturers noted that dynamic testing is conducted outside and that it is unreasonable to limit testing to the few days in the year when the ambient temperature would fall within the specified 12-degree range.

The commenters may misunderstand their certification responsibilities under the National Traffic and Motor Vehicle Safety Act. Section 108(b)(2) limits a manufacturer's responsibility to the exercise of "due care" to assure compliance. The NHTSA has long interpreted this statutory "due care" to mean that the manufacturer is free to test its products in any fashion it chooses, as long as the testing demonstrates that due care was taken to assure that, if tested by NHTSA as set forth in the standard, the product would comply with the standard's requirements. Thus, a manufacturer could conduct testing on a day with temperatures other than those specified, as long as it could demonstrate through engineering calculations or otherwise, that the difference in test temperatures did not invalidate the test results. Alternatively a manufacturer might choose to perform its preparation of the vehicle in a temporarily erected structure (such as a tent) that maintains a temperature within the specified range, so that only a short exposure during acceleration to the barrier would occur in a higher or lower temperature. To assist any such arrangements, the test temperature condition has been limited to require a stabilized temperature of the test dummy only, just prior to the vehicle's travel toward the barrier.

In response to an earlier suggestion from GM, the agency proposed further specificity in the clothing worn by the dummy during the crash test. The only comment was filed by GM, which



argued that any shoe specification other than weight would be unrelated to dummy performance and therefore should not be included in the specification. The agency disagrees, and notes that the size and shape of the heel on the shoe can affect the placement of the dummy limb within the vehicle. For this reason, the clothing specifications are made final as proposed, except that the requirement for a conforming "configuration" has been deleted.

Renault and Peugeot asked for confirmation that pyrotechnic pretensioners for belt retractors are not prohibited by the standard. The standard's requirements do not specify the design by which to provide the specified protection, and the agency is not aware of any aspect of the standard that would prohibit the use of pretensioning devices, as long as the three performance elements are met.

With regard to the test dummy used in the standard, the agency proposed two modifications of Standard No. 208: a more detailed positioning procedure for placement of the dummy in the vehicle prior to the test, and a new requirement that the dummy remain in calibration without adjustment following the barrier crash. Comments were received on both aspects of the proposal.

The dummy positioning was proposed to eliminate variation in the conduct of repeatable tests, particularly among vehicles of different sizes. The most important proposed modification was the use of only two dummies in any test of front seat restraints, whether or not the system is designed for three designated seating positions. The proposal was intended to eliminate the problem associated with placement of three 50th-percentile male dummies side-by-side in a smaller vehicle. In bench seating with three positions, the system would have to comply with a dummy at the driver's position and at either of the other two designated seating positions.

GM supported this change, but noted that twice as many tests of 3-position bench-seat vehicles would be required as before. The company suggested using a simulated vehicle crash as a means to test the passive restraint at the center seat position. The agency considers this approach unrepresentative of the actual crash pulse

and vehicle kinematic response (e.g., pitching, yawing) that occur during an impact. To the degree that GM can adopt such an approach in the exercise of "due care" to demonstrate that the center seating position actually complies, the statute does not prohibit such a certification approach.

Ford objected that the dummy at the center seat position would be placed about 4 inches to the right of the center of the designated seating position in order to avoid interference with the dummy at the driver's position. While the NHTSA agrees that a small amount of displacement is inevitable in smaller vehicles, it may well occur in the real world also. Further, the physical dimensions of the dummy preclude any other positioning. With a dummy at the driver's position, a dummy at the center position cannot physically be placed in the middle of the seat in all cases. In view of these realities, the agency makes final this aspect of the dummy positioning as proposed.

GM suggested the modification of other standards to adopt "2-dummy" positioning. The compatibility among dynamic tests is regularly reviewed by the NHTSA and will be again following this rulemaking action. For the moment, however, only those actions which were proposed will be acted on.

As a general matter with regard to dummy positioning, General Motors found the new specifications acceptable with a few changes. GM cautioned that the procedure might not be sufficiently reproducible between laboratories, and Chrysler found greater variation in positioning with the new procedures than with Chrysler's own procedures. The agency's use of the procedure in 15 different vehicle models has shown consistently repeatable results, as long as a reasonable amount of care is taken to avoid the effect of random inputs (see "Repeatability of Set Up and Stability of Anthropometric Landmarks and Their Influence on Impact Response of Automotive Crash Test Dummies." Society of Automotive Engineers, Technical Paper No. 770260, 1977). The agency concludes that, with the minor improvements cited below, the positioning procedure should be made final as proposed.

The dummy is placed at a seating position so that its midsagittal plane is vertical and longitudinal. Volkswagen argued against use of the midsagittal plane as a reference for dummy placement, considering it difficult to define as a practical matter during placement. The agency has used plane markers and plane lines to define the midsagittal plane and has experienced no significant difficulty in placement of the dummy with these techniques. For this reason, and because Volkswagen suggested no simpler orientation technique, the agency adopts use of the midsagittal plane as proposed.

Correct spacing of the dummy's legs at the driver position created the largest source of objection by commenters. Ford expressed concern that an inward-pointing left knee could result in unrealistically high femur loads because of femur-to-steering column impacts. GM asked that an additional 0.6 inch of space be specified between the dummy legs to allow for installation of a device to measure steering column displacement. Volkswagen considered specification of the left knee bolt location to be redundant in light of the positioning specification for the right knee and the overall distance specification between the knees of 14.5 inches.

The commenters may not have understood that the 14.5- and 5.9-inch dimensions are only initial positions, as specified in S8.1.11.1.1. The later specification to raise the femur and tibia centerlines "as close as possible to vertical" without contacting the vehicle shifts the knees from their initial spacing to a point just to the left and right of the steering column.

As for GM's concern about instrumentation, the agency does not intend to modify this positioning procedure to accommodate instrumentation preferences not required for the standard's purposes. GM may, of course, make test modifications so long as it assures, in the exercise of due care, that its vehicles will comply when tested in accordance with the specification by the agency.

In the case of a vehicle which is equipped with a front bench seat, the driver dummy is placed on the bench so that its midsagittal plane intersects the center point of the plane described by the steering wheel rim. BMW pointed out that

the center plane of the driver's seating position may not coincide with the steering wheel center and that dummy placement would therefore be unrealistic. Ford believed that the specification of the steering wheel reference point could be more precisely specified.

The agency believes that BMW may be describing offset of the driver's seat from the steering wheel in bucket-seat vehicles. In the case of bench-seat vehicles, there appears to be no reason not to place the dummy directly behind the steering wheel. As for the Ford suggestion, the agency concludes that Ford is describing the same point as the proposal did, assuming, as the agency does, that the axis of the steering column passes through the center point described. The Ford description does have the effect of moving the point a slight distance laterally, because the steering wheel rim upper surface is somewhat higher than the plane of the rim itself. This small distance is not relevant to the positioning being specified and therefore is not adopted.

In the case of center-position dummy placement in a vehicle with a drive line tunnel, Ford requested further specification of left and right foot placement. The agency has added further specification to make explicit what was implicit in the specifications proposed.

Volkswagen suggested that the NHTSA had failed to specify knee spacing for the passenger side dummy placement. In actuality, the specification in S8.1.11.1.2 that the femur and tibia centerlines fall in a vertical longitudinal plane has the effect of dictating the distance between the passenger dummy knees.

The second major source of comments concerned the dummy settling procedure that assures uniformity of placement on the seat cushion and against the seat back. Manufacturers pointed out that lifting the dummy within the vehicle, particularly in small vehicles and those with no rear seat space, cannot be accomplished easily. While the NHTSA recognizes that the procedure is not simple, it is desirable to improve the uniformity of dummy response and it has been accomplished by the NHTSA in several small cars (e.g., Volkswagen Rabbit, Honda Civic, Fiat Spider, DOT HS-801-754). Therefore, the requests of GM and Volkswagen to retain the



method that does not involve lifting has been denied. In response to Renault's question, the dummy can be lifted manually by a strap routed beneath the buttocks. Also, Volkswagen's request for more variability in the application of rearward force is denied because, while difficult to achieve, it is desirable to maintain uniformity in dummy placement. In response to the requests of several manufacturers, the location of the 9-square-inch push plate has been raised 1.5 inches, to facilitate its application to all vehicles.

Volkswagen asked with regard to S10.2.2 for a clarification of what constitutes the "lumbar spine" for purposes of dummy flexing. This refers to the point on the dummy rear surface at the level of the top of the dummy's rubber spine element.

BMW asked the agency to reconsider the placement of the driver dummy's thumbs over the steering wheel rim because of the possibility of damage to them. The company asked for an option in placing the hands. The purpose of the specification in dummy positioning, however, is to remove discretion from the test personnel, so that all tests are run in the same fashion. An option under these circumstances is therefore not appropriate.

Ultrasystems, Inc., pointed out two minor errors in S10.3 that are hereby corrected. The upper arm and lower arm centerlines are oriented as nearly as possible in a vertical plane (rather than straight up in the vertical), and the little finger of the passenger is placed "barely in contact" with the seat rather than "tangent" to it.

Two corrections are made to the dummy positioning procedure to correct obvious and unintended conflicts between placement of the dummy thighs on the seat cushion and placement of the right leg and foot on the acceleration pedal.

In addition to the positioning proposed, General Motors suggested that positioning of the dummy's head in the fore-and-aft axis would be beneficial. The agency agrees and has added such a specification at the end of the dummy settling procedure.

In a matter separate from the positioning procedure, General Motors, Ford, and Renault requested deletion of the proposed requirement that the dummy maintain proper calibration follow-

ing a crash test without adjustment. Such a procedure is routine in test protocols and the agency considered it to be a beneficial addition to the standard to further demonstrate the credibility of the dummy test results. GM, however, has pointed out that the limb joint adjustments for the crash test and for the calibration of the lumbar bending test are different, and that it would be unfair to expect continued calibration without adjustment of these joints. The NHTSA accepts this objection and, until a means for surmounting this difficulty is perfected, the proposed change to S8.1.8 is withdrawn.

In another matter unrelated to dummy positioning, Volkswagen argued that active belt systems should be subject to the same requirements as passive belt systems, to reduce the cost differential between the compliance tests of the two systems. As earlier noted the NHTSA has issued an advance Notice of Proposed Rulemaking (41 FR 54961, December 16, 1976) on this subject and will consider Volkswagen's suggestion in the context of that rulemaking.

Finally, the agency proposed the same belt warning requirements for belts provided with passive restraints as are presently required for active belts. No objections to the requirement were received and the requirement is made final as proposed. The agency also takes the opportunity to delete from the standard the out-of-date belt warning requirements contained in S7.3 of the standard.

#### RECONSIDERATION OF DOCKET 73-8; NOTICE 04

The NHTSA has received two petitions for reconsideration of recent amendments in its test dummy calibration test procedures and design specifications (Part 572, *Anthropomorphic Test Dummy*, 49 CFR Part 572). Part 572 establishes, by means of approximately 250 drawings and five calibration tests, the exact specifications of the test device referred to earlier in this notice that simulates the occupant of a motor vehicle for crash testing purposes.

Apart from requests for a technical change of the lumbar flexion force specifications, the petitions from General Motors and Ford contained a repetition of objections made earlier in the rulemaking about the adequacy of the dummy as an



objective measuring device. Three issues were raised: lateral response characteristics of the dummy, failure of the dummy to meet the five subassembly calibration limits, and the need for a "whole systems" calibration of the assembled dummy. Following receipt of these comments, the agency published notification in the *Federal Register* that it would entertain any other comments on the issue of objectivity (42 FR 28200; June 2, 1977). General comments were received from Chrysler Corporation and American Motors, repeating their positions from earlier comments that the dummy does not qualify as objective.

The objectivity of the dummy is at issue because it is the measuring device that registers the acceleration and force readings specified by Standard No. 208 during a 30-mph impact of the tested vehicle into a fixed barrier. The resulting readings for each vehicle tested must remain below a certain level to constitute compliance. Certification of compliance by the vehicle manufacturer is accomplished by crash testing representative vehicles with the dummy installed. Verification of compliance by the NHTSA is accomplished by crash testing one or more of the same model vehicle, also with a test dummy installed. It is important that readings taken by different dummies, or by the same dummy repeatedly, accurately reflect the forces and accelerations that are being experienced by the vehicle during the barrier crash. This does not imply that the readings produced in tests of two vehicles of the same design must be identical. In the real world, in fact, literally identical vehicles, crash circumstances, and test dummies are not physically attainable.

It is apparent from this discussion that an accurate reflection of the forces and accelerations experienced in nominally identical vehicles does not depend on the specification of the test dummy alone. For example, identically specified and responsive dummies would not provide identical readings unless reasonable care is exercised in the preparation and placement of the dummy. Such care is analogous to that exercised in positioning a ruler to assure that it is at the exact point where a measurement is to commence. No one would blame a ruler for a bad measurement if it were carelessly placed in the wrong position.

It is equally apparent that the forces and accelerations experienced in nominally identical vehicles will only be identical by the greatest of coincidence. The small differences in body structure, even of mass-produced vehicles, will affect the crash pulse. The particular deployment speed and shape of the cushion portion of an inflatable restraint system will also affect results.

All of these factors would affect the accelerations and forces experienced by a human occupant of a vehicle certified to comply with the occupant restraint standard. Thus, achievement of identical conditions is not only impossible (due to the inherent differences between tested vehicles and underlying conditions) but would be unwise. Literally identical tests would encourage the design of safety devices that would not adequately serve the variety of circumstances encountered in actual crash exposure.

At the same time, the safety standards must be "stated in objective terms" so that the manufacturer knows how its product will be tested and under what circumstances it will have to comply. A complete lack of dummy positioning procedures would allow placement of the dummy in any posture and would make certification of compliance virtually impossible. A balancing is provided in the test procedures between the need for realism and the need for objectivity.

The test dummy also represents a balancing between realism (biofidelity) and objectivity (repeatability). One-piece cast metal dummies could be placed in the seating positions and instrumented to register crash forces. One could argue that these dummies did not act at all like a human and did not measure what would happen to a human, but a lack of repeatability could not be ascribed to them. At the other end of the spectrum, an extremely complex and realistic surrogate could be substituted for the existing Part 572 dummy, which would act realistically but differently each time, as one might expect different humans to do.

The existing Part 572 dummy represents 5 years of effort to provide a measuring instrument that is sufficiently realistic and repeatable to serve the purposes of the crash standard. Like any measuring instrument, it has to be used with care. As in the case of any complex instrumentation,

particular care must be exercised in its proper use, and there is little expectation of literally identical readings.

The dummy is articulated, and built of materials that permit it to react dynamically, similarly to a human. It is the dynamic reactions of the dummy that introduce the complexity that makes a check on repeatability desirable and necessary. The agency therefore devised five calibration procedures as standards for the evaluation of the important dynamic dummy response characteristics.

Since the specifications and calibration procedures were established in August 1973, a substantial amount of manufacturing and test experience has been gained in the Part 572 dummy. The quality of the dummy as manufactured by the three available domestic commercial sources has improved to the point where it is the agency's judgment that the device is as repeatable and reproducible as instrumentation of such complexity can be. As noted, GM and Ford disagree and raised three issues with regard to dummy objectivity in their petitions for reconsideration.

*Lateral response characteristics.* Recent sled tests of the Part 572 dummy in lateral impacts show a high level of repeatability from test to test and reproducibility from one dummy to another ("Evaluation of Part 572 Dummies in Side Impacts"—DOT HS 020 858). Further modification of the lateral and rollover passive restraint requirements into an option that can be met by installation of a lap belt makes the lateral response characteristics of the dummy largely academic. As noted in Notice 4 of Docket 73-8 (42 FR 7148; February 7, 1977), "Any manufacturer that is concerned with the objectivity of the dummy in such [lateral] impacts would provide lap belts at the front seating positions in lieu of conducting the lateral or rollover tests."

While the frontal crash test can be conducted at any angle up to 30 degrees from perpendicular to the barrier face, it is the agency's finding that the lateral forces acting on the test instrument are secondary to forces in the midsagittal plane and do not operate as a constraint on vehicle and restraint design. Compliance tests conducted by NHTSA to date in the 30-degree oblique impact condition have consistently generated similar

dummy readings. In addition, they are considerably lower than in perpendicular barrier impact tests, which renders them less critical for compliance certification purposes.

*Repeatability of dummy calibration.* Ford questioned the dummy's repeatability, based on its analysis of "round-robin" testing conducted in 1973 for Ford at three different test laboratories (Ford Report No. ESRO S-76-3 (1976)) and on analysis of NHTSA calibration testing of seven test dummies in 1974 (DOT-HS-801-861).

In its petition for reconsideration, Ford equated dummy objectivity with repeatability of the calibration test results and concluded "it is impracticable to attempt to meet the Part 572 component calibration requirements with test dummies constructed according to the Part 572 drawing specification."

The Ford analysis of NHTSA's seven dummies showed only 56 of 100 instances in which all of the dummy calibrations satisfied the criteria. The NHTSA's attempts to reproduce the Ford calculations to reach this conclusion were unsuccessful, even after including the HO3 dummy with its obviously defective neck. This neck failed badly 11 times in a row, and yet Ford apparently used these tests in its estimate of 56 percent compliance. This is the equivalent of concluding that the specification for a stop watch is inadequate because of repeated failure in a stop watch with an obviously defective part. In this case, the calibration procedure was doing precisely its job in identifying the defective part by demonstrating that it did not in fact meet the specification.

The significance of the "learning curve" for quality control in dummy manufacture is best understood by comparison of three sets of dummy calibration results in chronological order. Ford in earlier comments relied on its own "round-robin" crash testing, involving nine test dummies. Ford stated that none of the nine dummies could pass all of the component calibration requirements. What the NHTSA learned through follow-up questions to Ford was that three of the nine dummies were not built originally as Part 572 dummies, and that the other six were not fully certified by their manufacturers as qualify-



ing as Part 572 dummies. In addition, Ford instructed its contractors to use the dummies as provided whether or not they met the Part 572 specifications.

In contrast, recent NHTSA testing conducted by Calspan (DOT-IIS-6-01514, May and June 1977 progress reports) and the results of tests conducted by GM (USG 1502, Docket 73-8, GR 64) demonstrate good repeatability and reproducibility of dummies. In the Calspan testing a total of 152 calibration tests were completed on four dummies from two manufacturers. The results for all five calibration tests were observed to be within the specified performance criteria of Part 572. The agency concludes that the learning curve in the manufacturing process has reached the point where repeatability and reproducibility of the dummy has been fully demonstrated.

Interestingly, Ford's own analysis of its round-robin testing concludes that variations among the nine dummies were not significant to the test results. At the same time, the overall acceleration and force readings did vary substantially. Ford argued that this showed unacceptable variability of the test as a whole, because they had used "identical" vehicles for crash testing. Ford attributed the variations in results to "chance factors," listing as factors placement of the dummy, postural changes during the ride to the barrier, speed variations, uncertainty as to just what part of the instrument panel or other structure would be impact loaded, instrumentation, and any variations in the dynamics of air bag deployment from one vehicle to another.

The agency does not consider these to be uncontrolled factors since they can be greatly reduced by carefully controlling test procedures. In addition, they are not considered to be unacceptable "chance factors" that should be eliminated from the test. The most important advantage of the barrier impact test is that it simulates with some realism what can be experienced by a human occupant, while at the same time limiting variation to achieve repeatability. As discussed, nominally identical vehicles are not in fact identical, the dynamics of deployment will vary from vehicle to vehicle, and humans will adopt a large number of different seated positions

in the real world. The 30-mph barrier impact requires the manufacturer to take these variables into account by providing adequate protection for more than an overly structured test situation. At the same time, dummy positioning is specified in adequate detail so that the manufacturer knows how the NHTSA will set up a vehicle prior to conducting compliance test checks.

*"Whole systems" calibration.* Ford and GM both suggested a "whole systems" calibration of the dummy as a necessary additional check on dummy repeatability. The agency has denied these requests previously, because the demonstrated repeatability and reproducibility of Part 572 dummies based on current specification is adequate. The use of whole systems calibration tests as suggested would be extremely expensive and would unnecessarily complicate compliance testing.

It is instructive that neither General Motors nor Ford has been specific about the calibration tests they have in mind. Because of the variables inherent in a high energy barrier crash test at 30 mph, the agency judges that any calibration readings taken on the dummy would be overwhelmed by the other inputs acting on the dummy in this test environment. The Ford conclusion from its round-robin testing agrees that dummy variability is a relatively insignificant factor in the total variability experienced in this type of test.

GM was most specific about its concern for repeatability testing of the whole dummy in its comments in response to Docket 74-14; Notice 01:

Dummy whole body response requirements are considered necessary to assure that a dummy, assembled from certified components, has acceptable response as a completed structure. Interactions between coupled components and subsystems must not be assumed acceptable simply because the components themselves have been certified. Variations in coupling may lead to significant variation in dummy response.

There is a far simpler, more controlled means to assure oneself of correct coupling of components than by means of a "whole systems" calibration. If, for example, a laboratory wishes to assure itself that the coupling of the dummy



neck structure is properly accomplished, a simple statically applied input may be made to the neck prior to coupling to obtain a sample reading, and then the same simple statically applied input may be repeated after the coupling has been completed. This is a commonly accepted means to assure that "bolting together" the pieces is properly accomplished.

*Lumbar spine flexion.* The flexibility of the dummy spine is specified by means of a calibration procedure that involves bending the spine through a forward arc, with specified resistance to the bending being registered at specified angles of the bending arc. The dummy's ability to flex is partially controlled by the characteristics of the abdominal insert. In Notice 04, the agency increased the level of resistance that must be registered, in conjunction with a decision not to specify a sealed abdominal sac as had been proposed. Either of these dummy characteristics could affect the lumbar spine flexion performance.

Because of the agency's incomplete explanation for its actions, Ford and General Motors petitioned for reconsideration of the decision to take one action without the other. Both companies suggested that the specification of resistance levels be returned to that which had existed previously. The agency was not clear that it intended to go forward with the stiffer spine flexion performance, quite apart from the decision to not specify an abdomen sealing specification. The purpose for the "stiffer" spine is to attain more consistent torso return angle and to assure better dummy stability during vehicle acceleration to impact speed.

To assure itself of the wisdom of this course of action, the agency has performed dummy calibration tests demonstrating that the amended spine flexion and abdominal force deflection characteristics can be consistently achieved with both vented and unvented abdominal inserts (DOT HS-020875 (1977)).

Based on the considered analysis and review set forth above, the NHTSA denies the petitions of General Motors and Ford Motor Company for further modification of the test dummy speci-

cation and calibration procedures for reasons of test dummy objectivity.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended as proposed with changes set forth below, and Part 572 (49 CFR Part 572) is amended by the addition of a new sentence at the end of § 572.5, *General Description*, that states: "A specimen of the dummy is available for surface measurements, and access can be arranged through: Office of Crashworthiness, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590."

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200; April 16, 1976), the Department has evaluated the economic and other consequences of this amendment on the public and private sectors. The modifications of an existing option, the simplification and clarification of test procedures, and the increase in femur force loads are all judged to be actions that simplify testing and make it less expensive. It is anticipated that the "two dummy" positioning procedure may occasion additional testing expense in some larger vehicles, but not the level of expense that would have general economic effects.

The effective date for the changes has been established as one year from the date of publication to permit Volkswagen, the only manufacturer presently certifying compliance of vehicles using these test procedures, sufficient time to evaluate the effect of the changes on the compliance of its products.

The program official and lawyer principally responsible for the development of this amendment are Guy Hunter and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 30, 1977.

Joan Claybrook  
Administrator

**42 F.R. 34299**  
**July 5, 1977**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Crash Protection****(Docket No. 74-14; Notice 10)**

The existing motor vehicle safety standard for occupant crash protection in new passenger cars is amended to require the provision of "passive" restraint protection in passenger cars with wheelbases greater than 114 inches manufactured on and after September 1, 1981, in passenger cars with wheelbases greater than 100 inches on and after September 1, 1982, and in all passenger cars manufactured on or after September 1, 1983. The low usage rate of active seat belt systems negates much of their potential safety benefit. However, lap belts will continue to be required at most front and all rear seating positions in new cars, and the Department will continue to recommend their use to motorists. It is found that upgraded occupant crash protection is a reasonable and necessary exercise of the mandate of the National Traffic and Motor Vehicle Safety Act to provide protection through improved automotive design, construction, and performance.

Dates: Effective date September 1, 1981.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Station, Room 5108—Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

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Supplementary Information:

Considerations Underlying the Standard

Under the National Traffic and Motor Vehicle Safety Act, as amended (the Act) (15 U.S.C. 1381 et seq.), the Department of Transportation

is responsible for issuing motor vehicle safety standards that, among other things, protect the public against unreasonable risk of death or injury to persons in the event accidents occur. The Act directs the Department to consider whether a standard would contribute to carrying out the purposes of the Act and would be reasonable, practicable, and appropriate for a particular type of motor vehicle (15 U.S.C. 1392(f)(3)). The standard must, as formulated, be practicable, meet the need for motor vehicle safety, and be stated in objective terms (15 U.S.C. 1392(a)). The Senate Committee drafting the statute stated that safety would be the overriding consideration in the issuance of standards. S. Rep. No. 1301, 89th Cong., 2d Sess (1966) at 6.

The total number of fatalities annually in motor vehicle accidents is approximately 46,000 (estimate for 1976), of which approximately 25,000 are estimated to be automobile front seat occupants. Two major hazards to which front seat occupants are exposed are ejection from the vehicle, which increases the probability of fatality greatly, and impact with the vehicle interior during the crash. Restraint of occupants to protect against these hazards has long been recognized as a means to substantially reduce the fatalities and serious injuries experienced at the front seating positions.

One of the Department's first actions in implementing the Act was promulgation in 1967 of Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), to make it possible for vehicle occupants to help protect themselves against the hazards of a crash by engaging seat belts. The standard requires the installation of lap and shoulder seat belt assemblies (Type 2) at front outboard designated seating positions (except in convertibles) and lap belt assemblies (Type 1)

at all other designated seating positions. The standard became effective January 1, 1968.

While it is generally agreed that when they are worn, seat belt assemblies are highly effective in preventing occupant impact with the vehicle interior or ejection from the vehicle, only a minority of motorists in the United States use seat belts. For all types of belt systems, National Highway Traffic Safety Administration (NHTSA) studies show that about 20 percent of belt systems are used (DOT HS 6 01340 (in process)). The agency's calculations show that only about 2,600 deaths (and corresponding numbers of injuries) of front seat occupants were averted during 1976 by the restraints required by Standard No. 208 as it is presently written.

Two basic approaches have been developed to increase the savings of life and mitigation of injury afforded by occupant restraint systems. More than 20 nations and two provinces of Canada have enacted mandatory seat belt use laws to increase usage and thereby the effective lifesaving potential of existing seat belt systems. The other approach is to install automatic passive restraints in passenger cars in place of, or in conjunction with, active belt systems. These systems are passive in the sense that no action by the occupant is required to benefit from the restraint. Passive restraint systems automatically provide a high level of occupant crash protection to virtually 100 percent of front seat occupants.

The two forms of passive restraint that have been commercially produced are inflatable occupant restraints (commonly known as air bags) and passive belts. Air bags are fabric cushions that are rapidly filled with gas to cushion the occupant against colliding with the vehicle interior when a crash occurs that is strong enough to register on a sensor device in the vehicle. The deployment is accomplished by the rapid generation or release of a gas to inflate the bag. Passive belt systems are comparable to active belt systems in many respects, but are distinguished by automatic deployment around the occupant as the occupant enters the vehicle and closes the door.

#### HISTORY OF STANDARD NO. 208

Because of the low usage rates of active belt systems and because alternative technologies were

becoming available, the initial seat belt requirements of Standard No. 208 were upgraded in 1970 to require passive restraints by 1974 (35 FR 16927; November 3, 1970). Most passenger car manufacturers petitioned for judicial review of this amendment (*Chrysler v. DOT*, 472 F.2d 659 (6th Cir. 1972)). The Sixth Circuit's review upheld the mandate in most respects but remanded the standard to the agency for further specification of a test dummy that was held to be insufficiently objective for use as a measuring device in compliance tests. The court stated with regard to two of the statutory criteria for issuance of motor vehicle safety standards:

We conclude that the issue of the relative effectiveness of active as opposed to passive restraints is one which has been duly delegated to the Agency, with its expertise, to make; we find that the Agency's decision to require passive restraints is supported by substantial evidence, and we cannot say on the basis of the record before us that this decision does not meet the need for motor vehicle safety. 472 F.2d at 675.

... we conclude that Standard 208 is practicable as that term is used in this legislation. 472 F.2d at 674.

As for objective specification of the test dummy device, a detailed set of specifications (49 CFR Part 572) was issued in August 1973 (38 FR 20449; August 1, 1973) and updated with minor changes in February 1977 (42 FR 7148; February 7, 1977). A full discussion of the test dummy specifications is set forth in a rulemaking issued today by the NHTSA concerning technical aspects of Standard No. 208 (42 FR 34299; FR Doc. 77-19138).

In March 1974, the Department made the finding that the test dummy is sufficiently objective to satisfy the *Chrysler* court remand (39 FR 10271; March 19, 1974). In the same notice, mandatory passive restraints were again proposed. Based on the comments received in response to that notice, the passive restraint mandate was once again proposed in a modified form in June 1976 (41 FR 24070; June 14, 1976). In the interim, General Motors Corporation manufactured, certified, and sold approximately 10,000 air-bag-equipped full-size Buicks, Olds-



mobiles, and Cadillacs. Volkswagen has manufactured and sold approximately 65,000 passive-belt-equipped Rabbit model passenger cars. Volvo Corporation has also introduced a relatively small number of air-bag-equipped vehicles into service. Ford Motor Company had earlier manufactured 831 air-bag-equipped Mercurys. These vehicles were manufactured under one of two options placed in the standard in 1971 to permit optional production of vehicles with passive restraint systems in place of seat belt assemblies otherwise required. In 1972, the standard was also amended to require an "ignition interlock" system on front seat belts to force their use before the vehicle could be started. This requirement, effective in September 1973, was revoked in October 1974 in response to a Congressional prohibition on its specification (Pub. L. 93-492, § 109 (October 27, 1974)).

The Department's final action on its June 1976 proposal ("The Secretary's Decision Concerning Motor Vehicle Occupant Crash Protection," hereinafter "the December 1976 decision") continued the existing requirements of the standard (42 FR 5071; January 27, 1977) and created a demonstration program to familiarize the public with passive restraints. The Department negotiated contracts with four automobile manufacturers for the production of up to 250,000 passive-equipped vehicles per year for introduction into the passenger car fleet in model years 1980-1. Mercedes-Benz agreed to manufacture 2,250 such passenger cars, and Volkswagen agreed to manufacture 125,000 of its passive-belt-equipped Rabbit models. Ford agreed to participate by "establishing the capability of manufacturing" 140,000 compact model passenger cars, and General Motors agreed to "establish production capacity" to manufacture 300,000 intermediate size passenger cars. The December 1976 decision was based on the finding that, although passive restraints are technologically feasible at reasonable cost and would prevent 9,000 fatalities annually when fully integrated into the fleet, possible adverse reaction by an uninformed public after the standard took effect could inspire their prohibition by Congress with substantial attendant economic waste and incalculable harm to the cause of highway safety. This finding was based in large part on the Department's experience

with the ignition interlock on 1974- and 1975-model passenger cars, which was prohibited by Congress in response to industry and public opposition.

Early in 1977, the Department reconsidered the December 1976 decision because public acceptance or rejection of passive restraints is not one of the statutory criteria which the Department is charged by law to apply in establishing standards. In addition, the demonstration program introduced a minimum 3-year delay in implementation of mandatory passive restraints. The Department questioned the premise that passive restraint systems would foster consumer resistance as had the ignition interlock system. While the ignition interlock system forced action by the motorist as a condition for operating an automobile, passive restraints eliminate the need for any action by the occupant to obtain their crash protection benefits.

A third reason for reassessment of the December 1976 decision was the certainty that an increasing proportion of the passenger car fleet will be small cars, in response to the energy situation and the automotive fuel economy program established by the Energy Policy and Conservation Act. The introduction of these new, smaller vehicles on the highway holds the prospect of an increase in the fatality and injury rate unless countermeasures are undertaken.

Based on this reconsideration, the Department proposed (42 FR 15935; March 24, 1977) that the future crash protection requirements of Standard No. 208 take one of three forms: (1) continuation of the present requirements, (2) mandatory passive restraints at one or more seating positions of passenger cars manufactured on or after September 1, 1980, or (3) continuation of the existing requirements in conjunction with proposed legislation to establish Federal or State mandatory seat belt use laws.

The proposal for an occupant restraint system other than seat belts invoked a provision of the Act (15 U.S.C. § 1400(b)) that requires notification to Congress of the action. The Act also requires that a public hearing be held at which any member of Congress or any other interested person could present oral testimony. The proposal was transmitted to the Congress on March

21, 1977, with an invitation to appear at a public hearing chaired by the Secretary on April 27 and 28, 1977, in Washington, D.C. A transcript of this meeting, along with written comments on the March 1977 proposal, are available in the public docket.

## DISCUSSION OF ISSUES

The March 1977 proposal of three possible courses of action for future occupant crash protection is grounded in a large, complex administrative record that has been developed in the 8 years since passive restraints were first contemplated by the Department. Interested persons are invited to review the NHTSA public docket that has been compiled under designations 69-7, 73-8, and 74-14. Consideration of the issues and questions that have arisen during the years of rulemaking can be found in the preambles to the Department's numerous rulemaking notices on passive restraints. Although many of the comments on the March 1977 proposal raised issues that have been discussed in previous notices, the significant issues will be addressed here again, in light of the most recent information available to the Department.

*The need for rulemaking action.* An important reason to consider anew the occupant crash protection issue is the basic and positive changes that the automobile will undergo in the years ahead. Until recently, the basic characteristics of automobiles sold to the American public have evolved for the most part in response to the forces of the market place. High premium was placed upon styling, roominess, and acceleration performance. In a cheap-energy society, relatively little attention was paid to efficiency of operation. Nor, until relatively recently, was serious consideration given to minimizing the adverse impact of the automobile upon air quality.

Recent circumstances, however, have drastically altered the situation, and have made it abundantly clear that the automobile's characteristics must reflect broadly defined societal goals as well as those advanced by the individual car owner. The President has announced a new national energy policy that recognizes a compelling need for changes in the American lifestyle. Congress has implemented statutory programs to improve

the fuel economy of automobiles, as one result of which this Department has just issued demanding fuel economy standards for 1981 through 1984 passenger cars. Right now, the Congress is deliberating over amendments to the Clean Air Act which will impose relatively stringent emissions requirements effective over the same time frame.

The trend toward smaller cars to improve economy and emissions performance contains a potential for increased hazard to the vehicles' occupants. But technology provides the means to protect against this hazard, and this Department's statutory mandate provides authority to assure its application. The Report of the Federal Interagency Task Force on Motor Vehicle Goals for 1980 and Beyond indicated that simultaneous achievement of ambitious societal goals for the automobile in the areas of fuel economy, emissions, and safety is technologically feasible. Integrated test vehicles developed by this Department confirm that finding and, further, demonstrate that the resulting vehicles need not unduly sacrifice the other functional and esthetic attributes traditionally sought by the American car buyer.

Moreover, the socially responsive automobile of the 1980's need not bring a penalty in economy of ownership. The just-issued passenger car fuel economy standards are calculated to reduce the overall costs of operating an automobile by \$1,000 over the vehicle's lifetime. In the case of improved safety performance, the occupant restraint improvements specified in this notice can be expected to pay for themselves in reduced first-person liability insurance premiums during the life of the vehicle.

The issue of occupant crash protection has been outstanding too long, and a decision would have been further delayed while the demonstration programs was conducted. A rigorous review of the findings made by the Department in December 1976 demonstrates that they are in all substantial respects correct as to the technological feasibility, practicability, reasonable cost, and lifesaving potential of passive restraints. The decision set forth in this notice is the logical result of those findings.



In reassessing the December 1976 decision, the Department has considered each available means to increase crash protection in arriving at the most rational approach. As proposed, the possibility of "driver-side only" passive protection was considered, but was rejected because of the unsatisfactory result of having one front-seat passenger offered protection superior to that offered other front-seat passengers in the same vehicle. On balance, there was found to be little cost or lead-time advantage to this approach. The possibility of reinstituting a type of safety belt interlock was rejected because the agency's authority was definitively removed by the Congress less than three years ago and there is no reason to believe that Congress has changed its position on the issue since that time.

*Mandatory belt use laws.* One of the means proposed in the March notice to achieve a large reduction in highway deaths and injuries is Federal legislation to induce State enactment of mandatory seat belt use laws, either by issuance of a highway safety program standard or by making State passage of such laws a condition for the receipt of Federal highway construction money.

The prospects for passage of mandatory seat belt use laws by more than a few States appear to be poor. None of the commenters suggested that passage of such laws was likely. A public opinion survey sponsored by the Motor Vehicle Manufacturers Association and conducted by Yankelovich, Skelly, and White, Inc. indicated that a 2-to-1 majority nationwide opposes belt use laws. Many such bills have been presented; no State has enacted one up to now. Also, Congress denied funding for a program to encourage State belt use laws in 1974, suggesting that it does not look favorably upon Federal assistance in the enactment of these laws.

More recently, Congress removed the Department's authority to withdraw Federal safety funding in the case of States that do not mandate the use of motorcycle helmets on their highways (Pub. L. 94-280, Sec. 208(a), May 5, 1976). The close parallel between requiring helmet use and requiring seat belt use argues against the likelihood of enactment of belt use laws.

These strong indications that Congress would not enact a belt use program in the foreseeable

future demonstrate, in large measure, why the success of other nations in enacting laws is not parallel to the situation in the United States. In the belt use jurisdictions most often compared to the United States (Australia and the Provinces of Canada), the laws were enacted at the State or Province level in the first instance, and not at the Federal level. In the Department's judgment, the most reasonable course of action to obtain effective belt use laws in the United States will be to actively encourage their enactment in one or more States. An attempt to impose belt use laws on citizens by the Federal government would create difficulties in Federal-State relations, and could damage rather than further the interests of highway safety.

*Effectiveness of passive restraints.* The December 1976 decision concluded that the best estimates of effectiveness in preventing deaths and injuries of the various types of restraint systems under consideration were as set forth in Table I. Using the effectiveness estimates from Table I, the projection of benefits attributable to various restraint systems is summarized in Table II. Several comments concerning the effectiveness of passive restraint systems were submitted in response to the March 1977 proposal.

Insurance company commenters generally supported the Department's estimates. General Motors, however, disputed the validity of the estimates in the December 1976 decision, arguing that the results experienced by the approximately 10,000 GM vehicles sold the public indicated a much lower level of effectiveness. It made comparisons between accidents involving those cars and other accidents with conventional cars, selected to be as similar as possible in type and severity. On the basis of this study, GM stated that the data indicate that the "current air cushion-lap belt system, if available in all cars, would save less than the nearly 3,000 lives that can be saved by only 20 percent active lap/shoulder belt use."

The Department finds the methods used in the General Motors study to be of doubtful value in arriving at an objective assessment of the experience of the air-bag-equipped vehicles. General Motors is a vastly interested party in these proceedings, and the positions that it adopts are necessarily those of an advocate for a particular



result. This is in no sense a disparagement; advocacy of desired outcomes by interested parties is an essential part of the administrative process. But if a study advanced by an interested advocate is to be seriously considered from a "scientific" viewpoint, it must be carefully designed to avoid dilution of its objectivity by the bias of the sponsoring party. The GM study fails that test. Its foundation is a long series of qualitative judgments, which are made by employees of the party itself. An equally serious fault is that the basic body of accident data from which the comparison accidents are selected is not available to the public, so that countering analyses cannot be made by opposing parties, nor can the judgments in the original study be checked. General Motors had previously submitted to an earlier Standard No. 208 docket a study of restraint system effectiveness based on similarly qualitative judgments by its own employees (69-07-GR-256-01). The shoulder belt effectiveness figures arrived at in that study were about one-half of what are now generally recognized to be the actual values. While this later study utilizes a somewhat different methodology, it suffers from the same flaws in its failure to preclude dilution of its objectivity by the bias of its sponsor.

Economics and Science Planning, Inc., submitted three studies that made estimates of air bag effectiveness. In one, the estimate of air bag effectiveness was at least as high as the theoretical projections made in Table II. In another, a very low estimate of air bag effectiveness was made—from 15 to 25 percent.

The Insurance Institute for Highway Safety submitted another estimate of air bag effectiveness based on the experience with the GM cars in highway use. A selection was made of accidents in which the air bag was designed to operate, based on frontal damage, direction of impact, and age of occupant. In these accidents, air bags were determined to have reduced fatalities by 66 percent, as compared to 55 percent for three-point belts. However, the narrow selection of accidents limits the application of the figures derived in the IIHS study.

The Department considers that the most reliable method of evaluating the experience of the air-bag-equipped cars at this time is to compare

the number of injuries, at various levels, sustained by their occupants with the number that is experienced in the general population of vehicles of this type. The vehicles in question are not a sampling of the general vehicle population: they are relatively new, and mostly in the largest "luxury" size class. Some adjustment must be made for these factors.

The adjustment for the size of the vehicles has been made by multiplying the overall injury figures by a factor of 0.643, which has been found in one study (Joksche, "Analysis of Future Effects of Fuel Storage and Increased Small Car Usage Upon Traffic Deaths and Injuries," General Accounting Office, 1975) as the ratio of fatalities per year for this size of vehicles to the figure for the general population. The newness of the vehicles has a double-edged aspect: newer vehicles are evidently driven more miles per year than older ones, but they also appear to experience fewer accidents per mile traveled (Dutt and Reinfurt, "Accident Involvement and Crash Injury Rates by Make, Model, and Year of Car," Highway Safety Research Center, 1977). These two factors can be accounted for if it is assumed that they cancel each other, by using vehicle years, rather than vehicle miles, as the basis of comparison. With these adjustments, the expected number of all injuries of AIS-2 (an index of injury severity) and above in severity for conventional vehicles equivalent to the air-bag-equipped fleet during the period considered was 91. The actual number experienced was 38, indicating an effectiveness factor for these injury classes of 0.58.

A possibility of bias in these estimates exists in that injuries that have occurred in the air bag fleet may not have been reported, despite the three-level reporting system (owners, police, and dealers) that has been established. This bias is less likely to be present in frontal accidents, where the air bag is expected to (and generally does) deploy. For frontal accidents only, the number of injuries expected is 60, or 66 percent of the total ("Statistical Analysis of Seat Belt Effectiveness in 1973-1975 Model Cars Involved in Towaway Crashes," Highway Safety Research Center, 1976); only 29 have been experienced, indicating an effectiveness factor of 0.52.

These figures confirm (and in fact exceed) the effectiveness estimates of the December 1976 decision. For injuries of higher severity levels, the numbers experienced are much too small to be statistically significant.

The various assumptions and adjustments that must be made to arrive at a valid "expected" figure, and the possibility that some injuries were unreported, leaves substantial room for uncertainty and argument as to the true observed effectiveness of the restraint systems. Nevertheless, the results of the field experience are encouraging. Even if the observed-effectiveness figures arrived at by these calculations were high by a factor of 2, they would still substantially confirm the estimates of the December 1976 decision. Considering all the arguments on both sides of the issues, the Department concludes that the observed experience of the vehicles on the road equipped with air bags does not cast doubt on the effectiveness estimates in the December 1976 decision.

It has been argued that the Department should not issue a passive restraint standard in the absence of statistically significant real world data which confirm its estimates of effectiveness. Statistical "proof" is certainly desirable in decisionmaking, but it is often not available to resolve public policy decisions. It is also clear from the legislative history of the Act that the Department was not supposed to wait for the widespread introduction of a technology before it could be mandated. The Senate report for example refers to the "failure of safety to sell" in automobiles, and describes how the Department was intended to push the manufacturers into adopting new safety technology that would not be introduced voluntarily (S. Rep. 1301, 89th Cong. 2nd Sess. 4 (1966)). The *Chrysler* case found that "The explicit purpose of the Act is to enable the Federal Government to impel automobile manufacturers to develop and apply new technology to the task of improving the safety design of automobiles as readily as possible." (472 F.2d at 671.)

*Cost of passive restraints.* Passive belts have been estimated in the past by the Department to add \$25 to the price of an automobile, relative to the price of cars with present active belt systems.

The increased operating cost over the life of a vehicle with passive belts is estimated to be \$5. These figures are assumed valid for purposes of this review, and were not contested in the comments received.

This Department, General Motors, Ford, DeLorean, and Minicars all have produced estimates of the passenger car price increase due to the inclusion of air bags. These are sufficiently detailed and current to be compared, and are set forth in Table III. The Department estimate has been raised somewhat above its previous ones because of the \$14 increase in the price of the components of an air bag system quoted by a supplier.

The General Motors estimates have been revised from previous estimates in several respects. Research and development, engineering, and tooling expenses are no longer amortized entirely in the first year, but are spread over 3 years (other estimates spread these costs over 5 years). The allowance for removal of active belt hardware has been reduced to conform more closely to the Department's estimates. The newer figures reflect a somewhat more complex system, including new sensors. Of the \$81 spread between the Department and the GM estimates, all but \$11 can be attributed to differences in the following areas: GM's estimate of dealer profit which is based on sticker prices (rather than actual sale price), GM's shorter amortization period, added complexity of the 1977 system over the 1976 system, and the cost of major modifications of the vehicle which the agency questions. The remaining \$11 difference must be considered as disagreement concerning the elements of cost shown in the table.

The Ford estimate is the same as previously submitted. Forty-two dollars of the difference from the Department estimate is a higher profit figure arising from Ford's use of sticker prices rather than actual price of sale, which gives the dealer less mark-up. A substantial amount of difference is for a complex electronic diagnostic module, extra sensors that the Department does not view as necessary, and the use of a knee bolster instead of a cheaper knee air bag. Thirty-nine dollars represents unreconciled differences.

Operating costs consist mainly of the cost of replacing a deployed bag, fuel cost, and maintenance.



nance. Ford also includes an amount for periodic inspection. The Department estimate for replacement cost differs from the GM and Ford estimates almost entirely as a result of the lower estimate for the first cost of the system. The fuel costs differ primarily as a result of different weight figures for the passive systems, which may be design choices of the manufacturers. The Department's evaluation of manufacturers' cost objections is being placed in the public docket as required by § 113 of the Act.

If, as projected, passive restraints are effective in saving lives and reducing injuries, as compared to existing belt systems at present use rate, the insurance savings that will result will offset a major portion, and possibly all, of the cost to the consumer of the systems. There may be some doubt on this point that arises from skepticism concerning the behavior of insurers.

The vast majority of auto occupant injuries beyond the minor level result in automobile, health, or life insurance claims. In some States, insurers may lack a degree of flexibility in the adjustment of premiums because of pressures from insurance commissions. However, the evidence indicates that premiums are fundamentally based on claims experience.

In its comments to the docket, Nationwide Mutual Insurance Companies estimated that savings in insurance premiums should average \$32.50 per insured car per year, if all cars were equipped with air bags. Of this amount, 75 percent is the result of an assumed savings of 24.6 percent in the bodily injury portion of automobile insurance premiums, 21 percent from a 1.5 percent reduction in health insurance premiums (30 percent of the 5 percent of the premiums that pay for auto-related injuries), and the remainder from savings in life insurance premiums. The American Mutual Insurance Alliance and Allstate referred to existing 30 percent discounts in first-party coverage and concluded that comparable reductions would be expected to follow a mandate of passive restraints.

It has been argued that these savings would be largely offset by the increased cost of collision and property damage insurance due to the increased cost of repairing a car with a deployed air bag. This claim appears to be largely un-

founded. Using figures based on field tests, it is estimated that each year 300,000 automobiles will be in accidents of sufficient severity to deploy the air bag. (Cooke, "Usage of Occupant Crash Protection Systems," NHTSA, July 1976, #74-14-GR-30, App. A.) Accepting vehicle manufacturer estimates, it is further assumed that the cost of replacing an air bag will be 2.5 times the original equipment cost. If a car more than 6 years old is involved in an air-bag-deploying accident, it is assumed scrapped rather than being repaired. Combining these assumptions with the estimated \$112 cost of installing a full front air cushion in a new vehicle gives a total annual cost of replacement of \$50.4 million, or a per car cost of less than 51 cents per year. Increases in collision premiums should, therefore, not exceed \$1 per car per year. It is noted that deployment in non-crash cases would be covered by "comprehensive" insurance policies.

The \$32.50 annual insurance savings estimated by Nationwide would be sufficient to pay for the added operating cost (around \$4 per year) of an air-bag-equipped car with enough left over to more than pay for the initial cost of the system. Discounting at the average interest rate on new car loans measured in real terms (6 percent), the air bag would almost recover the initial cost in 4 years, with a savings over operating cost of \$107.

Economic and Science Planning, Inc. (ESP) has submitted a differing estimate, that insurance savings with full implementation of passive restraints would be only \$3.60, rather than \$32.50 per year. About one-half of the difference arises from ESP's assumption that seat belt usage would voluntarily rise to the 44 percent level by 1984. This seems highly improbable, based on experience to date.

Moreover, that assumption does not support the deletion of projected insurance savings resulting from passive restraints, but suggests that other courses of action (such as whatever might be done to increase belt usage to 44 percent) might also produce savings. The remaining differences are based on such factors as the portion of injury costs that is paid for by insurance. If the assumptions of ESP are allowed to remain,



the savings per year would be about \$16, and the present value of auto-lifetime savings would be \$120.

*Side effects of air bag installation.* Some concerns were expressed in the comments about air bags that might be grouped as possible undesirable side effects. One of these was injuries that might be caused by design deployment. There is no question that any restraint system that must decelerate a human body from 30 mph or more to rest within approximately 2 feet can cause injury. Belt systems often cause bruises and abrasions in protecting occupants from more serious injuries. The main question is whether any injuries caused by air bags are generally within acceptable limits, and are significantly less severe than those that would have been suffered had the occupants in question not been restrained by the air bags. The evidence from the vehicles on the road indicates that this is indeed the case. The injuries cited by GM as possibly caused or aggravated by air bag deployment are in the minor to moderate (AIS-1 and -2) category. From this it can be concluded that injuries caused by design deployment, though worthy of careful monitoring with a view to design improvements by manufacturers, do not provide a serious argument against a passive restraint requirement.

A closely related question that has caused concern in the past is whether air bags pose an unreasonable danger to occupants who are not in a normal seating position, such as children standing in front of a dashboard or persons who have been moved forward by panic braking. Much development work has been devoted to this problem in the past, to design systems that minimize the danger to persons who are close to the inflation source. The most important change in this area has probably been the general shift away from inflation systems that depend on stored high-pressure gas, in favor of pyrotechnic gas generators. With these systems the flow of gas can be adjusted to make the rate slower at the beginning of inflation, so that an out-of-position occupant is pushed more gently out of the way before the maximum inflation rate occurs.

With one exception, there have been no cases where out-of-position occupants have been found

to be seriously injured in crashes in which air bags have deployed. Five of the crashes involving GM vehicles have involved children in front seating positions (although not necessarily out of position), and others have involved children unbelted in the rear seat.

The only exception has been the death of an infant that was lying laterally on the front seat unrestrained. Apparently during panic braking that proceeded the crash, the infant was thrown from the seat. While this constitutes an out-of-position situation technically, it is not the type of circumstance in which the air bag contributes to injury of the out-of-position occupant.

Inadvertent actuation of an air bag may be a particular concern to the public, as noted by both General Motors and Ford. The sudden deployment of an air bag in a non-crash situation would generally be a disconcerting experience. The experience with vehicles on the road, and tests that have been performed on 40 subjects who were not aware that there were air bags in their vehicles, indicate the loss of control in such situations should be rare: none has occurred in the incidents up to now. There is little question, however, that inadvertent actuation could cause loss of control by some segments (aged, inexperienced, distracted) of the driving population, and it must be viewed as a small but real cost of air bag protection.

The frequency of inadvertent actuation is therefore of special concern. The Ford fleet of air-bag-equipped cars (about 800 vehicles that have been on the road since late 1972, with around 500 now taken out of service) has experienced no inadvertent actuations at all. The General Motors fleet, about 10,000 sold mostly to private buyers during 1974 and 1975, has experienced three inadvertent actuations on the road. Six others have occurred in the hands of mechanics and body shop personnel, two in externally caused fires or explosions, and one from tampering in a driveway. The Volvo fleet of 75 vehicles has experienced none. It is believed that the causes of the GM inadvertent deployments are understood, and that the means of eliminating or considerably reducing the likelihood of all the known causes of inadvertent deployments have been found. These include shielding of the squibs (the device to ignite the propellant ma-

terial in the bag inflators) against electromagnetic radiation, automatically disarming the system through the ignition system when the car is not in operation, and routing wiring so that it is less accessible to tampering or degradation.

If the figures for the combined fleets are projected onto the U.S. vehicle population, they would amount to around 7,000 on-the-road inadvertent actuations annually, or one for every 15,000 vehicles. The chances of an individual experiencing one as a vehicle occupant during his or her lifetime would be on the order of 1 in 200. This estimate probably overstates the likelihood of occurrence since the inadvertent actuations in the GM cars to date are believed to be due to design deficiencies that are correctable. Thus, although it will probably continue to be a public concern, the infrequency with which inadvertent actuation occurs leads to the conclusion that it does not constitute a weighty argument against a passive restraint requirement.

Some private individuals expressed, in their comments, concern over possible ear damage, or injuries that might be caused to persons with smoking materials in their mouths, or wearing eyeglasses. Although some early tests with oversized cushions of prototype design produced some temporary hearing losses, later designs have reduced the sound pressures to the point where ear damage is no longer a significant possibility. With respect to eyeglasses and smoking materials, the results from the vehicles on the road have been favorable. Of the occupants that had been involved in air cushion deployments as of a recent date, 71 had been smoking pipes or wearing eyeglasses or other facial accessories. None of these received injuries beyond the minor (AIS-1) level. From this it can be concluded that these circumstances do not create particular hazards to occupants of air-bag-equipped vehicles.

Toyo Kogyo and some private individuals questioned whether air bags might experience reliability problems in high-mileage and older vehicles. The fact that air bags have only one moving part, and most of the critical components rest in sealed containers during their non-deployment life, indicates that they should perform well in this regard. The systems in the vehicles in the field, some of which have been in use for almost 5 years, have demonstrated extremely good

durability, with no apparent flaws. Manufacturers use sophisticated techniques such as accelerated test cycles to assure a high level of reliability.

Reliability of restraint systems is, of course, absolutely necessary. Unlike the failure of accident prevention systems such as lights and brakes where failure does not necessarily result in harm to occupants, the failure of a restraint system when needed in a serious crash almost certainly means injury will result. Vehicle and component manufacturers are fully aware of this and take the special precautions to ensure reliability which might not be taken for less critical systems. The Department is equally aware of it and has monitored manufacturer efforts to date to ensure fail-safe performance of crash-deployed systems. As an example, copies of reliability information request letters from the Department to manufacturers preparing for the demonstration program or otherwise involved in air bag systems have been made public in the docket.

The projections of reliability to date are, of necessity, based on pilot production volumes, and cannot demonstrate fully that reliability problems associated with mass production will never occur. So that manufacturers can avoid these types of reliability problems, the Department has settled on a phase-in of the requirements which is described later in greater detail.

General Motors and the National Automobile Dealers Association commented that product liability arising from air bag performance would be a major expense. The insurance company commenters, on the other hand, suggested that the presence of air bags in vehicles could reduce auto companies' product liability.

The new risk of liability, attached to a requirement for passive restraints, does not differ from the risk attached to the advent of any device or product whether mandated by the Federal government or installed by a manufacturer by its own choice. Just as liability might arise because of the malfunctioning of a seat belt system or braking system, liability may also arise because of the malfunctioning of a passive restraint system. The mandating of a requirement by the Federal government has, in fact, often served to limit liability, since most jurisdictions accord



great weight to evidence showing that a device has met Federal standards.

There is little evidence that the mandating of passive restraints will lead to increases in product liability insurance premiums. Although the advent of new technology has often been accompanied by an increase in products liability insurance, it is unclear how much of the increase is attributable to increased risk and how much to inflation. Officials of the Department of Commerce and at least two major insurance companies doubt that Federal passive restraint requirements will lead to increased risk and insurance premiums. They point out that Federal requirements are imposed to make products safer, and safe products are less likely to cause injury.

It is noteworthy that the Allstate Insurance Company agreed to sell product liability insurance for the GM cars which were to be equipped with passive restraint systems pursuant to the demonstration program, at a rate no greater than the product liability insurance rate for cars not equipped with passive restraint systems.

*Small cars.* An important consideration in the decision concerning passive restraints is their suitability and availability for small cars, which because of the energy shortage will comprise an increasing segment of the vehicle population in future years. Passive belts have been sold as standard equipment in over 65,000 Volkswagen cars, and must be viewed as a proven means of meeting a passive restraint requirement. Some vehicle body designs may require some modification for their installation, but passive belts could be used as restraints for most bucket-seat arrangements at moderate cost with present technology.

Some manufacturers have expressed doubt that a large proportion of their customers would find passive belts acceptable, because of their relatively obtrusive nature and the resistance shown by the U.S. public to wearing seat belt systems, i.e., belts that occupants must buckle and unbuckle. These manufacturers submitted no supporting market surveys. Further, there is reason to believe that the experience with active belt systems is not an accurate indicator of the experience to be expected with passive belts. The Department anticipates that some manufacturers

will install passive belts in the front seats of small cars having only two front seats. Passive belts would not confront the occupants of those seats with the current inconvenience of having to buckle a belt system to gain its protection or of having to unbuckle that system to get out of their cars. Unlike the interlock active belt systems of several years ago, the passive belt systems will have no effect on the ability of drivers to start their cars.

Nevertheless, the question of the acceptability of passive belts may make the suitability of air bags for small cars an important one. Although the shorter crush distance of small cars may impose more stringent limits on air bag deployment time, the evidence from studies conducted by the Department with air bags in small cars is that there are no insuperable difficulties in meeting the 30-mph crash requirements of Standard 208 in cars as small as 2000 pounds gross vehicle weight rating with existing air bag designs (see, for example, "Small Car Driver Inflatable Restraint System Evaluation Program," Contract DOT-HS-6-01412, Status Report April 15, 1977).

The "packaging" problems of installing air bag systems are greater for small cars than for larger ones. They occupy space in the instrument panel area that might otherwise be utilized by other items such as air conditioning ducts, glove compartment, or controls and displays. Toyo Kogyo (Mazda) and Honda indicated that their instrument panels might have to be displaced 4 inches rearward, that some engine compartment and wheelbase changes might be needed, and that some dash-mounted accessories might have to be deleted or mounted elsewhere. This type of problem is expected to be important to the existing choice between air bag and passive belt systems.

It is not the role of the government to resolve these problems since, in the Department's judgment, they reflect design choices of the manufacturers. No manufacturer has claimed, much less demonstrated, that it would be impracticable to install air bags in small cars without increasing vehicle size. Occupation of instrument panel space is certainly one of the unquantified costs of air bags, however, and the cost is more onerous in a small car than in a large one. At the same time, small car makers may choose to use the less



costly passive belt system. The evidence presented to date indicates that small-car manufacturers would be able to meet a passive restraint requirement by making reasonable design compromises without increasing vehicle size.

*Lead time and production readiness.* There was considerable discussion in the comments to the docket about the ability of the automobile industry to develop the production readiness to provide passive restraint systems for all passenger cars. The installation of passive restraint systems requires the addition of new hardware and modification of vehicle structures in such a way that the system provides performance adequate to meet the standard and a high level of safety and reliability on the road. A new industrial capacity will have to be generated to supply components for air bag systems. Major capital expenditures will have to be made by the vehicle industry to incorporate air bag systems into production models. The Department estimates that the total capital required for tooling and equipment for the production of passive restraint systems in new cars is approximately \$500 million.

Establishment of an industry to produce components for air bag systems centers on the production of the inflator component. Five major companies have indicated an interest in producing inflators for air bags. The propellant presently being considered for use is sodium azide. The primary source of sodium azide, Canadian Industries Ltd., has a capacity of around 1 million pounds per year, sufficient for only about 800,000 full front seat air bag systems. Thus, additional capacity of 10 million pounds or more of sodium azide will have to be generated, or alternative propellants would have to be used. The Department's analysis of the capital requirements and lead time to develop sufficient capacity indicates that adequate propellant can be available for annual production levels of several million units in less than three years. The production of inflators (from several sources) can reach several million units within two to three years of the receipt of firm orders, including design specifications, from the automobile manufacturers. A new capacity has already been generated to supply the demonstration program which is being pursued at this time.

The vehicle manufacturers face substantial work to incorporate air bags in their production. In the case of domestic manufacturers alone, the instrument panels of approximately half of the new cars that will be manufactured in the early 1980's will have to be completely redesigned to provide space for the passenger bag and structure to accept the loading on the passenger bag. In some cases, relocation of the instrument cluster is needed to facilitate visibility over the bag module in the steering hub.

The burden placed on the vehicle manufacturers to redesign the instrument panel and related components to accept air bags can be reduced considerably by phasing in the passive restraint requirements over several years. With phased introduction, the redesigning of instrument panels and other components can be done at roughly the same pace that these components would ordinarily be redesigned, although perhaps not within the manufacturer's preferred schedule.

The rulemaking docket contained a number of references to additional reasons for phased introduction of new systems like passive restraints: to establish quality systems in production, to obtain experience with these systems in the hands of a more limited segment of the public, and to obtain feedback on the performance and reliability of the systems. If production levels are relatively small at the beginning of a mandated requirement, any unforeseen issues that arise are made more manageable by the limited number of vehicles affected. A major automotive supplier, Eaton Corporation, stressed this aspect of production feasibility over all others.

Based on its evaluation, the Department has determined that a lead time of four full years should precede the requirement for the production of the first passive-equipped passenger cars. This lead time accords with General Motors' requested lead time to accomplish the change for all model lines. Equally important, the 4-year lead time represents a continuation to its logical conclusion of the early voluntary production of passive restraints represented by the December 1976 decision. The continued opportunity for early, gradual, and voluntary introduction of passive restraints to the public in relatively small numbers offers a great deal of benefit in assuring the orderly implementation of a mandatory

passive restraint requirement. Experience with the limited quantities of early passive-restraint-equipped vehicles can confirm in the public's mind the value of these systems prior to mandatory production. Because of the value of such a voluntary phase-in approach to both the manufacturer and the public, the Department anticipates that the manufacturers which were parties to the earlier demonstration program agreements will continue their current preparations for voluntary production of passive restraints. The Department also expects that other manufacturers will undertake to produce limited quantities prior to the effectivity of the mandate. The Department intends to vigorously support the efforts of manufacturers to foster sales on a voluntary basis, both through major public information programs and through efforts to encourage their purchase by Federal, other government agencies, and private-fleet users.

The Department also intends to initiate an intensive monitoring program to oversee the implementation plans of both vehicle manufacturers and their suppliers. The purpose of the monitoring program will be not only to confirm that adequate levels of reliability and quality are being achieved in implementing designs to comply with the standard, but also to provide assurance to the public that the issues that have been raised on passive restraint reliability are being resolved under the auspices of the Secretary of Transportation.

In addition to a long lead time, the Department considers that the mandate should be accomplished in three stages, with new standard- and luxury-size cars (a wheelbase of more than 114 inches) meeting the requirement on and after September 1, 1981, new intermediate- and compact-size cars (a wheelbase of more than 100 inches) also meeting the requirements on and after September 1, 1982, and all new passenger cars meeting the requirement on and after September 1, 1983.

Wheelbase was chosen as a measure to delineate the phasing requirements because it is a well-defined quantity that does not vary significantly within a given car line. With the downsizing of most automobiles made in the United States, wheelbases are being reduced by four to six inches on most standard-intermediate- and com-

pact-size cars. As a result, in the period of phased implementation (the 1982 through 1984 model years) standard-size cars will generally have wheelbases in a range of 115" to 120", intermediate-size cars will have wheelbases in a range of 107" to 113", and compact-cars will generally have wheelbases in a range of 102" to 108". Subcompact-size cars will continue to have wheelbases below 100".

The determination of which car sizes to include in each year of the phased implementation was made in consideration of the effect on each manufacturer and the difficulty involved in engineering passive restraints into each size class of automobile. Because of the extensive experience with passive restraints in full-size cars, and the space available in the instrument panels of these cars to receive air bag systems, this size car was deemed to be most susceptible to early implementation.

The gradual phase-in schedule is intended to permit manufacturers to absorb the impact of introducing passive restraint systems without undue technological or economic risk at the same time they undertake efforts to meet the challenging requirements imposed by emissions and fuel economy standards for automobiles in the early 1980's.

#### OTHER CONSIDERATIONS

Section 104(b) of the Act directs that the Secretary consult with the National Motor Vehicle Safety Advisory Council on motor vehicle safety standards. The Council has announced in an April 26, 1977, letter to the Department that "The Council feels that the time has come to move ahead with a fully passive restraint standard." The Council stated that it was recommending passive protection in the lateral and rollover modes as well as the frontal mode proposed by the Department. The Department therefore will take under consideration the Council recommendation, with a view to expanding the passive restraint requirement as new technology is advanced. The Council also recommended that mandatory seat belt use laws should also be promoted until the entire vehicle fleet is equipped with passive restraints. As noted, the Department intends to encourage States to enact such laws in their jurisdictions.



It is noted that the National Transportation Safety Board supported the mandate of passive restraints, with a cautionary note to preserve the present performance specification that permits meeting the requirement by means of passive belts as well as inflatable passive restraints.

The United Auto Workers Union, which represents the vast majority of the workers whose industry is affected by the mandate, has also advocated mandatory passive restraints to the Department.

The Council on Wage and Price Stability (the Council) supported the mandate of passive restraints, based on the assumptions that no serious technical problems exist with either the air bag or the passive belt system concept and that the Department's cost estimates are substantially correct. The Council based its support on the comparative costs of achieving benefits under the three approaches, finding passive restraints to be the most cost effective.

The Council urged that passive belt systems continue to be permitted as meeting the performance requirements of the standard, because they represent the least costly passive restraint system currently commercially available. Standard No. 208 has always been and continues to be a performance standard, and any device that provides the performance specified may be used to comply with the standards. With regard to passive belt systems, it is important that they remain available, particularly in the case of smaller-volume manufacturers who may not care to provide air bag type protection because of its engineering and tooling costs relative to production volume.

In accordance with S 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)), as implemented by Executive Order 11514 (3 CFR, 1966-1970 Comp., p. 902) and the Council on Environmental Quality's Guidelines of April 23, 1971 (36 FR 7724), the Department has carefully considered all environmental aspects of its three proposed approaches. A Draft Environmental Impact Statement (DEIS) was published March 25, 1977, and comments have been received and analyzed. The Final Environmental Impact Statement (FEIS) is released today. Petitions for reconsideration

based on issues and information raised in the FEIS may be filed for the next 30 days (49 CFR Part 553.35).

There was substantial agreement by commenters with the agency's conclusions about impacts on the consumption of additional natural resources, the generation of pollutants in the manufacturing process and in transporting the system throughout the vehicle's life, and on solid waste disposal problems. In response to the comments of General Motors and others on the DEIS, several estimates were revised. In the Department's view, the two most significant consequences of a passive restraint mandate are the use of large amounts of sodium azide as the generator of gas for air bags, and the increased consumption of petroleum fuel by automobiles because of the added weight of air bags.

Sodium azide is a substance that is toxic and that can burn extremely rapidly. The agency is satisfied that the material can be used safely both in an industrial setting and in motor vehicles during its lifetime, due to inaccessibility and strength of the sealed canisters in which it is packed. The problem is to assure a proper means of disposal. Junked vehicles that are shredded have batteries and gas tanks removed routinely, and the air bag could be easily deployed by an electric charge at the same time. A hazard remains, however, for those vehicles that are simply abandoned. However, the agency judges that the chemical's relative inaccessibility will discourage attempts to tamper with it. The proportion of abandoned cars is less than 15 percent of those manufactured. The Department will work with the Environmental Protection Agency to develop appropriate controls for the disposal of air bag systems employing sodium azide.

The additional weight of inflatable passive restraints was judged to increase the annual consumption of fuel by automobiles by 0.71 percent (about 521 million gallons annually). While this increase is not insignificant, the Department believes that it is fully justified by the prospective societal benefits of passive restraints. The Department took full account of the impact of a passive restraint standard in its recent proceeding to set fuel economy standards for 1981-1984 passenger automobiles.



In accordance with Department policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the Department has evaluated the economic and other consequences of this amendment on the public and private sectors. The basic evaluation is contained in a document ("Supplemental Inflation Impact Evaluation") that was developed in conjunction with the Department's June 1976 proposal of mandatory passive restraints. That evaluation has been reviewed and a supplement to it represents the Department's position on the effect of this rulemaking on the nation's economy.

The standard, as set forth below, allows manufacturers two options for compliance. First, a manufacturer may provide passive occupant crash protection in frontal modes only. If this option is chosen, the manufacturer must also provide lap belts at all seating positions in the automobile. The lap belts are provided to give crash protection in side and rollover crashes, and have a demonstrated effectiveness in these crash modes.

A second option for manufacturers is to provide full passive protection for front seat occupants in three crash modes: frontal, side and rollover. If a manufacturer can achieve this performance, it would not have to provide seat belts in the front seat. Under this option, lap belts would continue to be required for all rear seating positions.

The Department has found that use of any seat belt installed in accordance with the standard is necessary to enhance the safety of vehicle occupants. Thus, the Department continues to advocate the use of all seat belts installed at all seating positions in motor vehicles, regardless of whether the vehicle is also equipped with passive restraints.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

*Effective date finding:* Under § 125 of the Act, an amendment of Standard No. 208 that specifies occupant restraint other than belt systems shall not become effective under any circumstances until the expiration of the 60-day review period provided for by Congress under that section "unless the standard specifies a later date." Section 125 also provides that the standard does not become effective at all if a concurrent resolution of disapproval is passed by Congress during the review period. The Department's view of this section is that a "later date" can be established at the time of promulgation of the rule, subject to the possibility of reversal by the concurrent resolution.

The amendment is therefore issued, to become effective beginning September 1, 1981, for those passenger cars first subject to the new requirements. The reasons underlying the effective dates set forth in the standard have been discussed above. The establishment of the effective dates is accomplished at this time to provide the maximum time available for preparations to meet the requirements. The Congressional review period will be completed prior to the commitment of significant new resources by manufacturers to meet the upcoming requirements of the standard.

The program official and lawyer principally responsible for the development of this rulemaking document are Carl Nash and Tad Herlihy, respectively.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407))

Issued on June 30, 1977.

Brock Adams  
Secretary of Transportation

**42 F.R. 34299**  
**July 5, 1977**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208****Occupant Restraint Systems****(Docket No. 74-14; Notice 14)**

The purpose of this notice is to amend Safety Standard No. 208, *Occupant Crash Protection*, to provide for the optional use by motor vehicle manufacturers of alternatives to latches for releasing occupants from passive seat belt systems in emergencies and to allow means other than push buttons to operate the emergency release mechanisms of passive belt systems. The amendment is based on a proposal issued in response to a petition from General Motors Corporation to allow manufacturers greater latitude in designing emergency release mechanisms for passive belt system. The amendment will allow manufacturers to experiment with various emergency release mechanisms aimed at encouraging passive belt use by motorists, prior to the effective date of passive restraint requirements specified in this standard.

Effective date: date of publication.

Addresses: Petitions for reconsideration should refer to the docket number and notice number and be submitted to:

Docket Section, Room 5108—Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Guy Hunter, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2265).

Supplementary information: Safety Standard No. 208, 49 CFR 571.208, currently specifies that a seat belt assembly installed in a passenger car shall have a latch mechanism that releases at a single point by push-button action. General Motors petitioned for relief from this requirement for passive belts, following the issuance of the final rule requiring passenger cars to be equipped with passive restraints (air bags, pas-

sive belts or other means of passive, i.e., automatic, protection) (42 F.R. 34289; July 5, 1977). The petition described a "spool release" design General Motors would like to use on one of its passive belt systems. The system would include a shoulder belt that would not detach at either end. Rather, the design would allow the belt to "play out" or unwind from the retractor in an emergency, allowing sufficient slack for the door to be opened and the occupant to exit from the vehicle. The purpose of such a "spool release" design is to minimize the disconnection of the passive belt system by motorists. Under the current latch mechanism and push-button requirements for belts, a passive belt system could be easily disconnected by a buckle release identical to buckles on current active belt systems (i.e., belts that motorists must manually put into place). As long as the belt remains disconnected, the "passivity" of the system would be destroyed for future use.

In response to the GM petition, the NHTSA issued a proposal to amend Standard 208 to allow alternative release mechanisms for passive belts (43 F.R. 21912, May 22, 1978). As noted in that proposal, the NHTSA is very concerned about the usage rate of passive belts by motorists since it appears that there may be many new cars in the 1980's equipped with these systems. If motorists who would prefer air bags in a particular car line can only obtain passive belts from the manufacturer, the defeat rate of the belts could be high. The agency is, therefore, interested in fostering any passive belt design that is effective and that minimizes the rate of disconnection. The notice pointed out, however, that there are other factors to be considered in the proposed change.

The original purpose of the latch mechanism and push-button requirements of Standard 208



was to ensure uniformity of buckle design for the purpose of facilitating routine fastening and unfastening of active belts, encouraging belt use by making the belts as convenient as possible and facilitating the exiting of vehicle occupants in emergency situations. Since the proposed amendment would allow various types of release mechanisms, the agency was concerned that the resulting nonuniformity might have adverse consequences in emergency egress situations from passive belts. In order to examine the implications of the General Motors petition thoroughly, the proposal sought public comments on four specific questions concerning the efficacy and advisability of allowing alternative mechanisms to latches for passive belt systems. The four questions were as follows:

(1) "How should the NHTSA or the vehicle manufacturers monitor the efficacy of and public reaction to various systems for discouraging disconnection of passive belts (such as the latch mechanism with a 4- to 8-second audible/visible warning system that operates if the belt is not connected when the ignition is turned on, a latch mechanism with additional warning or interlock systems voluntarily installed by a vehicle manufacturer, or a lever operated spool release as requested by General Motors?"

(2) "Are there safety or other considerations that would make it inadvisable to allow the spool release at this time as an option to vehicle manufacturers which install passive belts?"

(3) "Compared with a passive belt system equipped with the currently required latch mechanism, would a passive belt system equipped with a spool release whose actuation lever is located between the seats have substantial disadvantages for emergency exit or extraction from a vehicle that would offset any possible increase in usage in the passive belts?"

(4) "If the NHTSA decides to permit the use of alternative occupant release mechanisms, should such use be permitted indefinitely or only for a finite period, e.g., several years, to allow field testing of the various systems? If a finite period were to be established, when should it begin and end?"

All fifteen comments to the May 22, 1978, notice supported the intent of the proposed change to allow alternative release mechanisms for passive

belts. Most commenters agreed that a nonseparable passive belt should discourage disconnection by motorists and that this should be given higher priority consideration than possible adverse effects such a belt might have on emergency occupant egress. Volkswagen did express some concern that the benefits achieved by increased belt usage might be somewhat offset if problems with emergency exiting arise, but agreed that more flexibility in passive belt design should be allowed to encourage belt use.

Volkswagen urged the use of the passive belt system utilized on its Deluxe Rabbit—a push-button release latch mechanism guarded by an ignition interlock. The company stated that this type system is simple and works well in emergency situations regardless of the condition of the retractor or the positioning of the webbing (potential problems of a "spool release" type design). Volkswagen pointed out that a system that is too complex will require close monitoring to ensure effectiveness.

While the Volkswagen system has shown high use rates in the field, there is a possibility that widespread use of this type system could lead to adverse public reaction because of the interlock feature. As pointed out by the Alliance of American Insurers in its support of the proposed amendment, there could be a second public "backlash" from a return to the use of starter interlocks, even if placed on the vehicle voluntarily by the manufacturer. Alliance stated that the "spool release" system proposed by General Motors should be preferable to the interlock from a public acceptance standpoint.

The Center for Auto Safety and the Prudential Property and Casualty Insurance Company both commented that "spool release" type mechanisms should be self-restoring to ensure that in subsequent uses of the vehicle the passive belt is ready to provide the automatic protection for which it was designed. The self-restoring feature would automatically retract the belt after the manual release has been activated to allow the belt to "play-out." The NHTSA believes that both self-storing "spool release" designs and manual restoration designs have distinct advantages. The automatic restoration does not require the vehicle user to have any knowledge of the system to reactivate the passive belt. How-

ever, a manual restoration design would be less complex and would probably be more reliable. The manual design could be coupled with audible and visible warnings to indicate when the lock-up portion of the retractor is inoperative. The amendment set forth in this notice allows both types of restoration systems for "spool release" passive belt designs.

The majority of commenters argued that the proposed amendment should be effective indefinitely, and not merely during the interim period until the passive restraint requirements become effective. The comments stated that manufacturers should be given the greatest possible design latitude to encourage the early introduction of innovative passive belt systems that are designed to minimize disconnection by motorists. The industry noted that manufacturers will be hesitant to initiate such new programs and passive belt designs if alternative release designs are allowed only for an interim period. Further, the commenters stated that an interim rule would not allow time for an adequate examination of the effectiveness of the various new designs that might be developed. The agency has concluded that these arguments have merit. Accordingly, this amendment is effective indefinitely.

Several comments stated that the new passive belt designs should be standardized, so that the public will understand their use and problems of emergency occupant egress will be minimized. While the agency agrees that uniformity in release design is advantageous, it is not practical to standardize systems that are only in the development stage. Further, if manufacturers are not given latitude in their passive belt designs, the purpose of this amendment would be defeated. It is unclear at this time which passive belt systems will be the most effective in encouraging belt use and at the same time be accepted by the public. The agency will, of course, monitor all new passive belt systems as closely as possible, and efforts to standardize systems could be made in the future.

Ford Motor Company commented that the revision of Standard No. 208 as requested in the General Motors petition would provide greater latitude than presently exists, but that the requested wording is restrictive in that it would inhibit the development of methods of release

other than those specifically related to the retractor. Ford requested that the proposed revision include language permitting manufacturers the greatest possible design latitude. The agency emphasized in the previous notice that the proposal was tentative as to the language and substance of an amendment that might be adopted in response to the General Motors petition. Accordingly, this amendment is broader than that proposed in the General Motors petition and does not limit the types of passive belt designs that may be developed.

In order to ensure that vehicle occupants are aware if their passive belts are inoperable because a release mechanism has been activated, this amendment specifies that the warning light, "Fasten Belt," remain illuminated until the belt latch mechanism has been fastened or the release mechanism has been deactivated. This warning light of indefinite duration is in addition to the 4- to 8-second audible warning signal currently required by the standard. The agency believes a continuous warning light is essential, since this amendment will allow various types of unfamiliar release systems for passive belts.

In summary, the agency has concluded that manufacturers should be given considerable latitude in designing emergency release mechanisms for passive belt systems. This will permit the development of innovative systems aimed at limiting passive belt disconnection by motorists. Otherwise, the use rate of passive belt systems could be as low as the current use rate for active belt systems. This amendment will allow manufacturers to experiment with various passive belt designs before the effective date of the passive restraint requirements and determine which designs are the most effective and at the same time acceptable to the public.

The agency does not believe that the use of alternative release mechanisms will cause serious occupant egress problems if manufacturers take precautions to instruct vehicle owners how the systems work through the owner's manual and through their dealers. While uniformity in release mechanisms is certainly important for purposes of emergency occupant egress, the agency has concluded that this consideration is at least temporarily outweighed by the importance of ensuring passive belts are not discon-

nected. The agency will, however, monitor all new passive belt designs to assure that the release mechanisms are simple to understand and operate. If the methods of operation of the various release mechanisms are self-evident, the problem of lack of uniformity in design will be less important in terms of emergency occupant egress.

The agency has concluded that this amendment will have no adverse economic or environmental impacts.

The engineer and lawyer primarily responsible for the development of this rule are Guy Hunter and Hugh Oates, respectively.

In consideration of the above, Standard No. 208 (49 CFR 571.208) is amended. . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407), delegation of authority at 49 CFR 1.50.)

Issued on November 1, 1978.

Joan Claybrook  
Administrator

**43 F.R. 52493-52494**  
**November 13, 1978**



48 months of lead time is justified. This is particularly true for smaller-volume manufacturers who have done little passive restraint development work and are only now studying specific designs for their 1982 and 1983 model year products.

It should be noted that the lead time authorized is required by the facts and circumstances presented in this particular and complex rule-making and in no way is to be considered as a precedent for the calculation of lead time in any other standard which may later be promulgated by the agency.

The Center also advocated that the changes necessary to install passive restraints should occur at the same time instead of being phased-in over three years. The Center suggested that accommodation of the manufacturers' preferences, specifically their plans to meet future emissions and fuel economy requirements, had dictated the 3-phase implementation. This is not the case. The major vehicle redesign and retooling for materials conservation, fuel economy, and emissions that has been and will occur through the early 1980's must be considered in reaching any determination about the technical and economic feasibility of automotive regulatory actions of DOT. A thorough evaluation of the consequences of this passive restraint decision requires no less.

However, the requirements for improved occupant restraints were not subordinated to the attainment of fuel economy or emissions requirements. The preamble to DOT's fuel economy rulemaking makes clear that downward adjustment in the fuel economy levels was made to accommodate the weight of passive restraints. As earlier explained, a 4-year lead time was judged to be reasonable and appropriate to assure that a satisfactory product could be developed by most manufacturers in the United States market for most of their products.

The decision to require only a portion of production to comply in the first year further recognizes the limit on the available tooling industry capacity to accomplish major changes, and the demands this industry will face within the next several years because of an unprecedented combination of regulatory requirements and commercial pressures. A manufacturer with several

vehicle offerings ordinarily undertakes major product changes in only a portion of its production at one time. Assuming a 4-year cycle within the industry for substantial changes, for example, it is evident that only about one-fourth of the engineering and tooling capacity resources necessary to change the entire production are in place and available for use in any one year. The lead times provided are based on reasonable utilization of available tooling and the objective that reliable and effective passive restraint systems be developed.

The longer lead time allowed for smaller cars is also intended to provide the alternatives to small-car manufacturers for the installation of air bag systems in lieu of the simpler passive belt systems. The development of either type of occupant crash protection for smaller cars presents a greater engineering challenge than for large cars, and some makers of smaller cars have significantly smaller engineering resources than do the makers of the majority of larger cars. The Department intended to provide sufficient lead time so that the most effective designs can be fully considered and tested before production decisions must be reached. The agency considers that its analysis, reported in the "Explanation of Rule Making Action," provides ample justification for a phase-in as the practicable approach to meeting the need for motor vehicle safety in upgrading automobile occupant crash protection.

The Center argued that a phase-in of requirements in stages that distinguish among vehicles on the basis of a design characteristic (wheelbase length) is not authorized by the Act. The Center argued that "type" distinction does not include wheelbase distinctions. The Center also asserts that the DOT believes it has only "across-the-board" authority to implement standards, and that Congress acquiesced in this view by not providing DOT additional phase-in authority in the 1974 amendments to the Act.

The Department has repeatedly utilized "type" distinctions based on design in carrying out the Act. The basic vehicle type distinctions used to distinguish the phasing of requirements among passenger cars, multipurpose passenger vehicles, and light trucks are not expressly authorized by the Act. DOT established the distinction to ra-

tionally implement the Act. The wheelbase distinction has been used in the bumper safety standard No. 215, *Exterior Protection*, to implement upgraded requirements as expeditiously as possible. This regular practice contradicts the assertion that DOT itself believes it has "across-the-board" authority only. The DOT 1974 request for "percentage of production" phase-in authority in no way applies to the question of phase-in authority based on design distinctions such as wheelbase length, weight, or chassis type, that the Department already had.

Congress has in fact implicitly approved phase-in based on design distinction by its 1974 ratification of Standard No. 301-75, *Fuel System Integrity*, in a form that contains a gross vehicle weight rating (GVWR) phase-in criterion. Such design distinctions have been relied on by DOT and acquiesced in by Congress, the industry, and the public since the Act's inception.

Finally, the agency does not agree that the legislative history cited by the Center supports the proposition that phase-ins are illegal. The quoted statement by Senator Magnuson states that standards will apply to every vehicle, but does not address the question of *when* they would. The refusal by Congress to authorize phase-in by "customary model change" criteria in no way excludes the authority to phase-in by design distinction. The Senate Report language addresses particular vehicle changes that take more than a year to implement, and simply notes that the DOT is authorized to set later dates for those changes. This passage does not address the question of later dates for a particular category of vehicle.

The Center asserted that inadequate notice of the implementation schedule had been provided by the Department, because the September 1981 date was adopted in place of the proposed 1980 date, and because the wheelbase phase-in was adopted in place of the proposed phase-in by occupant position. While conceding that "every precise change ultimately adopted need not be published", the Center believed that inadequate opportunity was made available to the public to address the implementation schedule.

The Department has fully considered the Center's objection in the light of its public notices,

hearings, and the rulemaking record on Standard 208. The question is whether the public has had sufficient notice of the issue (the timing of mandatory passive restraint installation). As a general matter, some changes from the proposal are inherent in the notice and comment process so that the rulemaker can benefit from comments and modify the rulemaking without having to repropose every time new information is learned.

In this case, the notice proposed a timing schedule, and the notice indicated that the implementation was tentative, even suggesting a phase-in at occupant positions as an alternative timing approach. The Draft Environmental Impact Statement described phase-in alternatives, and many parties in their written and oral comments raised the issue of the timing for the mandate. The Center itself commented on timing which demonstrates that they were sufficiently aware of the issue to comment on it.

#### Implementation of the Standard

An important element in implementing the passive restraint requirements is to ensure that they are introduced in significant numbers prior to the time they are required by mandate. While passive belt systems are already in use in substantial numbers on the Volkswagen Rabbit (about 80,000 cars), relatively few air bag systems are in highway service. The two major reasons to have passive restraints voluntarily produced prior to the mandate are to familiarize the public with passive restraint technology and to work out early problems in production systems that could interfere with orderly implementation of the mandate and jeopardize success of the program.

The Department is taking steps to provide for voluntary early introduction. In addition to Volkswagen, GM and Ford have indicated plans to introduce passive belts as an option as early as the 1979 and 1980 model years, respectively. Ford and GM have also announced the intention of making an air bag option available in one or more models in the 1981 model year, one year before the mandate. The Department commends this initiative and is encouraging these companies to expand this commitment to introduce air bags voluntarily in the 1980 model year and in other



than full-size cars. The Department will continue to monitor the performance of voluntarily introduced systems, both air bags and passive belts, as it has to date.

In support of manufacturers' efforts to market air bags earlier than the mandate, the Department has contacted the General Services Administration, State and local government operators of fleet vehicles, the insurance companies, rental fleet owners, taxi operators, and other institutional users of passenger cars to encourage the purchase of air bag cars. This is the most direct inducement to the manufacturers to make air bags available earlier than the initial September 1981 effective date. Complementary activities to assist the early introduction of the systems are: (1) a DOT public education campaign that is already underway throughout the country, (2) monitoring component and vehicle manufacturers' implementation programs to assure proper attention is given to cost, reliability, and effectiveness, and (3) continued research, development, and evaluation of passive restraint systems to insure that the best overall passive restraint technology is available to manufacturers and the public, both now and in the future.

#### Other Issues

The Pacific Legal Foundation filed a petition for review of the rule in the Court of Appeals for the District of Columbia. It then asked the Department to stay the effective date of the rule for a period of time equal to the length of judicial review.

The Foundation, in its application for a stay, listed in general terms a number of items it said the Department failed to consider or evaluate appropriately. The Department did, however, review and assess all of those items before announcing the rule. It discussed many of them extensively in the preamble to the rule and the accompanying "Explanation of Rule Making Action". Upon receiving the application for a stay the Department reconsidered all of those items and it finds that the Pacific Legal Foundation's list of objections has no merit.

The Foundation argued that the Department should stay the rule pending judicial review because manufacturers will make capital expenditures preparing to comply with the rule

in model year 1982 and if the Court then overturns the rule, manufacturers may abandon the passive restraint program and pass on these preparation expenses to new car buyers. The Foundation thus asks the Department to balance a possible loss of a relatively small amount of money against a certain loss of lives and increase in injuries. The Department does not know how much time the Court will need to review the rule, but each year's continuance of the rule will add only a few dollars to the price of a new car while each year's delay of the rule will ultimately cost the public thousands of preventable fatalities and many more thousands of preventable serious injuries. The potential harm the Pacific Legal Foundation seeks to avoid through a stay is trivial compared to the cost of a stay in lives that cannot be restored, injury that cannot be repaired, and suffering that cannot be erased. This rule has already remained unresolved for too long. The Department denies Pacific Legal Foundation's application for a stay.

Some manufacturers repeated many of their earlier objections, all of which were extensively addressed in the preamble that accompanied the decision and the supplementary "Explanation of Rule Making Action". Not only were these issues fully ventilated in the rulemaking action, but they were also extensively treated in the hearings and subsequent reports of the Senate and House Commerce Committees as a part of their review of the standard. The Department does not consider repetitious petitions as a part of the reconsideration process (49 CFR § 553.21) and accordingly denies them.

One new issue raised was Ford's complaint that the NHTSA response on test dummy objectivity had misinterpreted Ford data on testing conducted in 1973. While the Ford dummy test program performed in 1973 may have been an ambitious attempt to investigate all of the variables involved in a vehicle crash test, subsequent development and test programs to reduce sources of test variability have made the Ford test series obsolete. As noted in the preamble to Notice 11, dummy manufacturers have gained experience in the manufacture of dummies, the Part 572 specifications and test procedures have been further defined, and the dummy positioning procedures in Standard No. 208 have been modi-



fied for bench-seat cars to eliminate the problem noted in the Ford tests of fitting 3 dummies side-by-side in the test.

Ford did not contest the more recent findings (DOT-HS-6-01514) of hard-seat sled tests of pairs of dummies with belts, air bags, and unrestrained, showing coefficients of variation on the pooled data basis for head accelerations from 1.2 percent to 10.7 percent, for chest acceleration from 1.6 percent to 8.5 percent, and for femur compressive force from 3.51 percent to 24.2 percent. Similar results were obtained in sled test oblique impacts (DOT-HS-802-570). In the face of this un rebutted conclusive evidence of the repeatability of current commercial dummy production, the agency finds the test instrument and associated procedure to be objective.

It has been brought to the attention of the Department that the NHTSA's decision to continue indefinitely the existing requirements for multipurpose passenger vehicles and light trucks was imperfectly stated. A corrective amendment of S4.2.2 is accomplished by this notice.

Volkswagen petitioned to have a longer transition period between the existing requirements for dummy positioning and the upcoming ones published in Notice 11 (42 FR 34299, July 5, 1977), because the company will not be able to evaluate the new requirements by July 5, 1978, yet must continue to certify its passive-belt-equipped Rabbit model. The Automobile Importers Association and General Motors suggested that compliance with either the old or new requirements, at the manufacturer's option, be permitted immediately. The NHTSA considers optional procedures more desirable than specifying the old procedures longer than one year as suggested by Volkswagen. Under optional procedures, Volkswagen can continue its certification of the Rabbit model, effecting a transition at any time, while the manufacturers undertaking new development efforts can immediately utilize the new procedures. To accomplish this, the effective dates of the requirements of Notices 10 and 11 are changed to become effective immediately.

with modifications of the language as necessary to preserve the old procedures as an option until September 1, 1981. These minor adjustments are accomplished in this notice.

Ford noted that the dummy head adjustment procedure of S10.4 was not consistent with dummy construction, which positions the head automatically. The NHTSA had intended that the dummy head and neck system be shimmed to compensate for different seat back angles in vehicles being tested. Because of the relative difficulty in accomplishing this in relation to the amount of specificity gained thereby, the NHTSA hereby deletes S10.4 as requested by Ford.

For the reasons stated above and after full consideration of the petitions by all parties submitted, the Department of Transportation denies petitions for reconsideration of its June 30, 1977, decision to require the installation of automatic crash protection in future passenger cars. The requirements set forth at 42 FR 34289 and 42 FR 34299 (July 5, 1977) are final for purposes of review in accordance with § 105(a) of the Act.

In consideration of the foregoing, Standard No. 28 (49 CFR 571.208) is amended. . . .

*Effective date finding:* Because the amendments provide an option and do not create additional requirements for any person, it is found that an immediate effective date is in the public interest so that manufacturers may take advantage of the new option as rapidly as possible.

The program official and lawyer principally responsible for the development of this rule-making document are Ralph Hitchcock and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407))

Issued on December 5, 1977.

Brock Adams  
Secretary of Transportation  
**42 F.R. 61466**  
**December 5, 1977**

**PREAMBLE TO AMENDMENT TO  
FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208**

**Occupant Crash Protection in Passenger Cars, Multipurpose Passenger  
Vehicles, Trucks and Buses**

**(Docket No. 74-14; Notice 14)**

*Action:* Final rule.

*Summary:* The purpose of this notice is to amend Safety Standard No. 208, Occupant Crash Protection, to provide for the optional use by motor vehicle manufacturers of alternatives to latches for releasing occupants from passive seat-belt systems in emergencies and to allow means other than pushbuttons to operate the emergency release mechanisms of passive belt systems. The amendment is based on a proposal issued in response to a petition from General Motors Corp. to allow manufacturers greater latitude in designing emergency release mechanisms for passive belt systems. The amendment will allow manufacturers to experiment with various emergency release mechanisms aimed at encouraging passive belt use by motorists, prior to the effective date of passive restraint requirements specified in this standard.

*Effective date:* November 13, 1978.

*Address:* Petitions for reconsideration should refer to the docket number and notice number and be submitted to: Docket Section, Room 5108, Nassif Building, 400 Seventh Street SW., Washington, D.C. 20590.

*For further information contact:*

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car line can only obtain passive belts from the manufacturer the defeat rate of the belts could be high. The agency is, therefore, interested in fostering any passive belt design that is effective and that minimizes the rate of disconnection. The notice pointed out, however, that there are other factors to be considered in the proposed change.

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1. "How should the NHTSA or the vehicle manufacturers monitor the efficacy of and public reaction to various systems for discouraging disconnection of passive belts (such as the latch mechanism with a 4-8 second audible/visible warning system that operates if the belt is not connected when the ignition is turned on, a latch mechanism with additional warning or interlock systems voluntarily installed by a vehicle manufacturer, or a lever operated spool release as requested by General Motors)?"

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that would offset any possible increase in usage in the passive belts?"

4. "If the NHTSA decides to permit the use of alternative occupant release mechanisms, should such use be permitted indefinitely or only for a finite period, e.g., several years, to allow field testing of the various systems? If a finite period were to be established, when should it begin and end?"

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not given latitude in their passive belt designs, the purpose of this amendment would be defeated. It is unclear at this time which passive belt systems will be the most effective in encouraging belt use and at the same time be accepted by the public. The agency will, of course, monitor all new passive belt systems as closely as possible, and efforts to standardize systems could be made in the future.

Ford Motor Co. commented that the revision of standard No. 208 as requested in the General Motors petition would provide greater latitude than presently exists, but that the requested wording is restrictive in that it would inhibit the development of methods of release other than those specifically related to the retractor. Ford requested that the proposed revision include language permitting manufacturers the greatest possible design latitude. The agency emphasized in the previous notice that the proposal was tentative as to the language and substance of an amendment that might be adopted in response to the General Motors petition. Accordingly, this amendment is broader than that proposed in the General Motors petition and does not limit the types of passive belt designs that may be developed.

In order to insure that vehicle occupants are aware if their passive belts are inoperable because a release mechanism has been activated, this amendment specifies that the warning light, "Fasten Belts," remain illuminated until the belt latch mechanism has been fastened or the release mechanism has been deactivated. This warning light of indefinite duration is in addition to the 4- to 8-second audible warning signal currently required by the standard. The agency believes a continuous warning light is essential since this amendment will allow various types of unfamiliar release systems for passive belts.

In summary, the agency has concluded that manufacturers should be given considerable latitude in designing emergency release mechanisms for passive belt systems. This will permit the development of innovative systems aimed at limiting passive belt disconnection by motorists. Otherwise, the use rate of passive belt systems could be as low as the current use rate for active belt systems. This amendment will allow manu-

facturers to experiment with various passive belt designs before the effective date of the passive restraint requirements and determine which designs are the most effective and at the same time acceptable to the public.

The agency does not believe that the use of alternative release mechanisms will cause serious occupant egress problems if manufacturers take precautions to instruct vehicle owners how the systems work through the owner's manual and through their dealers. While uniformity in release mechanisms is certainly important for purposes of emergency occupant egress, the agency has concluded that this consideration is at least temporarily outweighed by the importance of insuring passive belts are not disconnected. The agency will, however, monitor all new passive belt designs to assure that the release mechanisms are simple to understand and operate. If the

methods of operation of the various release mechanisms are self-evident, the problem of lack of uniformity in design will be less important in terms of emergency occupant egress.

The agency has concluded that this amendment will have no adverse economic or environmental impacts.

The engineer and lawyer primarily responsible for the development of this rule are Guy Hunter and Hugh Oates, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407), delegation of authority at 49 CFR 1.50.)

Issued on November 1, 1978.

Joan Claybrook  
Administrator

**43 F.R. 52493**  
**November 13, 1978**

# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208**

## **Occupant Protection (Docket No. 78-16; Notice 3)**

**SUMMARY:** This notice responds to petitions for reconsideration of the November 29, 1979, notice (44 F.R. 68470) amending Standard No. 208, *Occupant Crash Protection*. In response to petitions from the Motor Vehicle Manufacturers Association and Chrysler Corporation, the agency is deleting the requirement for emergency-locking or automatic-locking seat belt retractors at the outboard seating positions of the second seat in forward control vehicles. The effect of this deletion is to permit manufacturers to continue to use manual adjusting devices for the seat belts at those seating positions.

**EFFECTIVE DATE:** March 27, 1980.

**FOR FURTHER INFORMATION CONTACT:** Mr. William E. Smith, Office of Vehicle Safety Systems, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2242)

**SUPPLEMENTARY INFORMATION:** On November 29, 1979, NHTSA published a notice amending Standard No. 208, *Occupant Crash Protection* (44 F.R. 68470). The amendment deleted the exemption for forward control vehicles from several of the occupant restraint system requirements of the standard. (A forward control vehicle is one with a short front end. More than half of the engine is located to the rear of the forward point of the windshield base and the steering wheel hub is in the forward quarter of the vehicle.)

Chrysler Corporation and the Motor Vehicle Manufacturers Association (MVMA) filed petitions for reconsideration concerning the amendment. They argued that the November 1978 notice of proposed rulemaking for the amendment only proposed a change in the requirements for the safety belt systems in the front seat of forward control

vehicles and did not give adequate notice about a change in the requirements for belts in the second seat of forward control vehicles (43 F.R. 52264). They said that the amendment adopted in the final rule requires forward control vehicles to have lap and shoulder belts in the front outboard designated seating positions and have automatic-locking or emergency-locking retractors at the outboard designated seating positions of the second seat of the vehicle.

The petitioners have correctly described the requirements added by the amendment. The amendment applies the requirements of § 4.2.2 of Standard No. 208 to all forward control vehicles manufactured after September 1, 1981. Section 4.2.2 requires a manufacturer to meet one of the following three occupant crash protection requirements: § 4.1.2.1, complete automatic protection, § 4.1.2.2, head-on automatic protection or § 4.1.2.3, lap and shoulder belt protection system. Manufacturers choosing to comply with § 4.1.2.3 must install seat belt assemblies meeting the adjustment requirements of § 7.1 of the standard. The provisions of § 7.1 require that the seat belt assemblies installed at the outboard seating positions of the front and second seats adjust by means of an emergency-locking or automatic-locking retractor. Seat belt assemblies installed at all other seating positions can adjust either by an emergency-locking or automatic-locking retractor or by a manual adjusting device. Prior to the November 1979 amendment of Standard No. 208, forward control vehicles did not have to meet the requirements of § 4.2.1.3 but instead could meet § 4.2.1.2, which did not require the use of emergency-locking or automatic-locking retractors in the outboard seating positions of those vehicles.

The agency's November 1978 notice of proposed rulemaking was addressed to the specific portion



of Standard No. 208 exempting forward control vehicles from the shoulder belt requirements. The final rule eliminating the exemption inadvertently changed the requirements for the second seats of light trucks and vans as well. Therefore, the agency is amending the standard to retain the current seat belt requirement for the second seat in light trucks and vans. The agency notes that one manufacturer (GM) of forward control vehicles voluntarily equips its vehicles with automatic-locking retractors and urges Chrysler to do the same. The agency will consider eliminating the

remaining forward control exemptions from Standard No. 208 in future rulemaking.

The principal authors of this notice are Mr. William E. Smith, Office of Vehicle Safety Systems, and Mr. Stephen L. Oesch, Office of Chief Counsel.

Issued on March 18, 1980.

Joan Claybrook,  
*Administrator,*

**45 F.R. 20103**  
**March 27, 1980**

# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208**

## **Occupant Crash Protection**

**(Docket Nos. 1-18 and 74-14; Notices 16 and 18)**

**ACTION:** Final rule (correction).

**SUMMARY:** The purpose of this notice is to correct an amendment to Safety Standard No. 208, *Occupant Crash Protection*, that was issued September 27, 1979 (44 F.R. 55579). That notice amended the seat belt warning system requirements of the standard to specify the use of the seat belt telltale symbol that is specified in Safety Standard No. 101-80, *Controls and Displays*. In that amendment, certain warning system requirements, which had previously been deleted from Standard No. 208, were incorrectly reinserted in the standard. This notice corrects those errors. Further, this amendment makes clear that the telltale symbol of Standard No. 101-80 will supersede certain existing requirements in Standard No. 208 after Standard No. 101-80 becomes effective September 1, 1980.

**DATES:** These amendments are effective on July 14, 1980.

**FOR FURTHER INFORMATION CONTACT:** Mr. Hugh Oates, Office of Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2992)

**SUPPLEMENTARY INFORMATION:** The seat belt warning system requirements of Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), currently specify that under certain conditions, when seat belts are not fastened, the words "Fasten Belts" or "Fasten Seat Belts" shall be displayed on the vehicle dashboard. On June 26, 1978, the NHTSA published Safety Standard No. 101-80 (49 CFR 571.101-80) to establish new uniform requirements for the location, identification, and illumination of controls and displays in

motor vehicles. That standard specifies a telltale symbol that is to be illuminated when a vehicle's front seat belts have not been fastened. The standard is to become effective September 1, 1980.

On September 27, 1979, the agency amended Safety Standard No. 208 to permit the optional use of the seat belt telltale symbol specified in Safety Standard No. 101-80 prior to the effective date of that standard (44 F.R. 55579). However, that amendment failed to clarify that, after the effective date of Standard No. 101-80 (September 1, 1980), the telltale symbol will be required to be used in a vehicle's belt warning system. This notice clarifies that point.

When the seat belt telltale symbol was added to Safety Standard No. 208, the amendment inaccurately stated the pertinent sections of the standard that were to be modified. Further, paragraph S4.5.3.3(b) (1) inadvertently omitted language concerning the audible warning. This notice adds the omitted language for that paragraph and, additionally, deletes the parenthetical "(1)" in the paragraph heading. Since there is no longer a subparagraph "(2)," the heading should be specified as "S4.5.3.3(b)."

The 1979 amendment also incorrectly added two sections to the warning system requirements that had previously been deleted from the standard, S7.3.1 and S7.3a. This mistake occurred because the warning system requirements are incorrectly codified in Title 49 of the Code of Federal Regulations. On July 5, 1977 (42 F.R. 34299), Safety Standard No. 208 was amended to delete section S7.3 and to redesignate section S7.3a as S7.3 (as the sections were numbered at that time). When this amendment was codified in the Code of Federal Regulations, however, only paragraph S7.3 was deleted, not the entire section (S7.3 through S7.3.5.4). Instead, S7.3a was transposed

as S7.3 and S7.3.1 through S7.3.5.4 remained. Unfortunately, these deleted sections were used as a reference when the seat belt telltale symbol amendment was added to Standard No. 208. This notice also corrects that error.

Issued on July 7, 1980.

Michael M. Finkelstein,  
*Associate Administrator for Rulemaking.*

**45 F.R. 47151**

**July 14, 1980**



**PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD  
NO. 208**

**Occupant Crash Protection  
(Docket No. 74-14; Notice 19)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends Safety Standard No. 208, *Occupant Crash Protection*, to specify additional performance requirements for both manual and automatic safety belt assemblies installed in motor vehicles with a Gross Vehicle Weight Rating (GVWR) of 10,000 pounds or less. These performance requirements are specified in order to prevent the installation of particularly inconvenient and uncomfortable belt assemblies and to ensure that people are not discouraged from using belts because of their design or performance. This amendment does not include several provisions that were contained in the notice or proposed rulemaking preceding this rule. Based on comments received in response to the proposal, the agency has determined that only certain of the specifications should become mandatory at the present time. Consideration involving cost, lead-time and the encouragement of innovative seat belt designs have led the agency to conclude that the other provisions should be issued only as performance guidelines that manufacturers should follow where possible, or find alternative means to accomplish the same ends. The performance guidelines will be published in a separate *Federal Register* notice.

**DATE:** Effective date: September 1, 1982.

**ADDRESS:** Any petitions for reconsideration should refer to the docket number and notice number and be submitted to: National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:** Mr. Robert Nelson, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590. (202-426-2264)

**SUPPLEMENTARY INFORMATION:** Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), currently requires most motor vehicles to be equipped with safety belts at each designated seating position. Beginning in September 1981, and phasing in over the following two years, new passenger cars will have to provide automatic occupant crash protection (i.e., occupant restraint that requires no action by occupants, such as fastening seat belts, to be effective). Many new automobiles will be equipped with automatic belts to comply with the automatic restraint requirements (automatic belts move into place around a vehicle occupant automatically when he or she enters the car and closes the door). The requirements specified in this amendment are designed to remove some of the most egregious disincentives to use of current belt designs to ensure that both the automatic belts and the manual belts installed in future vehicles will be comfortable and convenient to use.

The requirements specified in this notice are applicable to seat belt assemblies installed in all vehicles with a GVWR of 10,000 pounds or less, except for Type 2 manual belts (lap and shoulder combination belts) installed in front seating positions in passenger cars through the 1983 model year. As noted in the proposal preceding this amendment (44 F.R. 77210), Type 2 manual belts will be phased out in passenger cars when the automatic restraint requirements of Standard No. 208 become effective. Accordingly, the agency believes that manufacturers should be allowed to focus their efforts and resources regarding comfort and convenience on manual belts in vehicles other than passenger cars and on developing the Type 1 manual belts (lap belts) which will be installed in rear seats in passenger cars and in some front seats in conjunction with air bags and single diagonal automatic belts.

As stated in the notice of proposed rulemaking the discomfort and inconvenience of current seat belt designs are among the most prominent factors resulting in the current low rate of safety belt use (approximately 11 percent). The proposal cited various studies which conclude that comfort and convenience play a determinative role in whether people continue to use the safety belts installed in their vehicles after they first try them (DOT HS-801-594; DOT HS-803-370). Some of the problems identified in these studies include: many belts are difficult to reach; many belts do not fit properly (e.g., they cross the occupant's neck); the pressure of many shoulder belts is felt to be excessive, particularly by women; many belts are difficult to buckle; and many belts become too tight after they have been worn for several minutes and their users have moved around.

In order to alleviate the most serious of these problems, the notice of proposed rulemaking sought to establish a variety of relatively simple, objective performance requirements that would improve the comfort and convenience of seat belt systems. Specifications involving the following performance areas were therefore proposed: torso belt occupant fit; belt retraction; adjustable buckles for certain belts; belt/seat cushion clearance; torso belt body contact pressure; automatic locking retractors (ALR's) were to be restricted; "comfort clips" were to be precluded; latchplate accessibility; webbing guides; convenience hooks for belt webbing clearance between webbing and the occupant's head; and specifications for motorized belt systems.

There were 38 comments in response to the proposal from vehicle manufacturers, seat belt assembly manufacturers, public interest groups and consumers. All comments were considered and the most significant are discussed in this notice. In response to those comments, and for reasons set forth more fully below, the agency has concluded that this amendment will only include specifications relating to: latchplate accessibility; seat belt guides; adjustable buckles for certain belts; shoulder belt pressure; convenience hooks; belt retraction; and comfort devices. The other provisions of the proposal will be issued to the public only as performance guidelines which manufacturers may voluntarily follow if they choose. Those guidelines will be issued in a separate *Federal Register* notice.

### **Proposed Provisions Not Included in This Amendment**

(The following section sets forth the major comments to the proposed provisions that are not being included in this amendment. A general discussion of the agency's response to these comments follows after the summary.)

There were nine comments to the proposed amendment from concerned citizens. Five of these consumers supported the proposed rulemaking and stated that they have experienced extreme comfort and convenience problems with their seat belt systems. Three citizens opposed the proposal on the basis that the rulemaking represents unwarranted government interference. Finally, one commenter objected to the technical nature of the proposal, stating that the specifications were difficult to understand.

Almost all vehicle manufacturers supported the concept of the proposal that seat belt assemblies should be convenient to use and comfortable to wear. However, most manufacturers disagreed with the agency's contention that there is a demonstrable relationship between seat belt comfort and convenience and belt usage rates and that improving comfort and convenience will improve those rates. Additionally, most manufacturers did not agree that the specifications proposed by the agency would lead to belt designs that are appreciably more comfortable and convenient. For example, Ford Motor Company stated that although it does not deny that there may be some correlation between comfort and convenience and wearing rates at the extremes (i.e., for very comfortable belts or belts that are particularly uncomfortable), there is no objective evidence that a measurable relationship exists between comfort and convenience and wearing rates. Ford also stated that certain of the proposed requirements would not accommodate a large number of vehicle occupants (e.g., Ford stated that the fit zone specified in the proposal would only ensure that belts properly fit 60 percent of the population. The proposal stated the agency's belief that the fit zone would ensure over 90 percent of the population had comfortable belts). The Motor Vehicle Manufacturers Association stated that experience has shown that the incorporation of features in belt systems to improve their comfort and convenience has not resulted in increased seat belt use, and that comfort and convenience are highly subjective con-



cepts that are not readily quantifiable. Chrysler Corporation stated that comfort and convenience improvements alone will not result in a substantial increase in belt use. Chrysler stated that the only way to improve seat belt use is to enact mandatory seat belt use laws. Volkswagen of America stated that the proposed modifications would actually eliminate several of the most promising existing automatic seat belt designs because of design restrictions. General Motors Corporation cited a study conducted for it by MOR, Inc., which indicated that removal of all perception of discomfort and inconvenience in belt systems would result in only a 1.7 percent increase in seat belt usage. The NHTSA proposal indicated that usage could be increased about 8 percent, and took exception to the MOR study. General Motors argued that the NHTSA has not adequately demonstrated, however, why the conclusions in the MOR study are invalid. American Motors Corporation stated that manufacturers already incorporate adequate comfort and convenience features in their belt systems and that regulatory action is, therefore, not warranted in this case.

The American Seat Belt Council, Hamill Manufacturing Company and other commenters supported the rationale of the proposal totally. Hamill stated that comfort and convenience is of paramount importance to 75–80 percent of the non-user segment of the driver population, who already perceive that seat belts are effective in mitigating the risk of death and injury in vehicle crashes but are dissuaded from using the belts because of perceived inconvenience and discomfort. Volvo of America Corporation acknowledged that comfort and convenience is one factor that influences usage, but stated that the major reason for the low rates of seat belt use is lack of motivation on the part of the motoring public.

In addition to the general negative comments concerning the relationship between seat belt comfort and convenience and wearing rates, many commenters (vehicle manufacturers) argued that certain of the proposed specifications would adversely affect belt effectiveness in vehicle crashes. For example, several manufacturers argued that the comfort zone for belt webbing specified in the proposal would require belt anchorages in some vehicle models to be in locations that are not the optimum location for belt performance in restraining victims in a crash situation.

### **Torso Belt Occupant Fit (Manual and Automatic Belts)**

To alleviate problems of torso belt fit such as rubbing of the occupant's neck, the proposal specified a zone in which the torso belt would have to lie on a test dummy placed in a vehicle. The zone was established to ensure that belts are installed so that the torso belt crosses the occupant's shoulder and chest approximately midway between the neck and shoulder tip, and crosses the sternum approximately midway between the breasts. The proposed requirements specified geometric criteria to describe the required chest-crossing envelope.

The motor vehicle manufacturers were unanimous in their opposition to the proposed torso belt fit requirement. Their objections were primarily related to: the location of the specified compliance zone on the Part 572 test dummy; the location of the test dummy in the vehicle; the width of the compliance zone on the Part 572 test dummy; and the test procedure to determine compliance.

Manufacturers argued that the test procedure is not objective and repeatable because of the complexities and variability associated with locating the dummy in a specific position in the vehicle. They also argued that the procedure for placing the belt around the test dummy (the "rocking" procedure) is not objectively stated. Most manufacturers argued that the 3-inch width of the fit zone specified in the proposal is too design restrictive. Additionally, Ford argued that its tests show that the 3-inch zone would only assure proper fit on approximately 60 percent of the driving population (the agency stated in the proposal that 90 percent of the population would have the proper fit with the proposed specifications). Ford did not substantiate how it arrived at this conclusion, however. Manufacturers argued that the fit zone should be at least 3.6 inches wide and possibly as much as five inches wide in order to ensure repeatability of the compliance procedure. Manufacturers stated that the location of the compliance zone on the test dummy would not necessarily place the belt in the optimum position for effectiveness in crashes in certain vehicle models. They based this assumption on the fact that in certain current vehicle models both the belt anchorages would have to be moved to place the belt in the specified zone. The manufacturers argued that these new anchorage locations would degrade belt performance in some instances.



### **Clearance Between Webbing and Seat Cushion (Automatic Belts)**

As noted in the notice of proposed rulemaking, the shift from manual to automatic belts may initially lead to confusion on the part of some persons. The lower end of many automatic shoulder belt designs is attached between the two front seating positions. The upper end is attached to the rear upper corner of the front door. If the lap belt or torso belt of an automatic belt system is designed so that it lies on the seat cushion or against the seatback cushion(s) when the belt system is reeled-out in its open-door position, some people are likely to be confused about how to get into the vehicle. Additionally, if the belt is lying on or hanging slightly above the seat cushion, it is likely to pull against clothing in an irritating fashion as the occupant tries to sit down. These factors led the agency to propose minimum specifications for webbing/seat clearance (three inches) so that people would not be encouraged to disconnect automatic belts because of the inconvenience.

Most manufacturers opposed the minimum specification for webbing/seat clearance. The comments stated that there is no safety rationale for the requirement because any misconception concerning the proper way to enter the vehicle would be removed after the occupant became familiar with the vehicle. Peugeot stated that experience has shown that the occupant can easily push the strap aside for a moment in order to enter the vehicle. The company argued that the proposed requirement is tantamount to requiring the installation of an automatic mechanism to move the belt system's top anchor's position. (Note: In response to this specific comment, the agency would not consider a belt system that had to be manually moved out of the way by the occupant to be an "automatic" system that would satisfy the requirements of the standard; see 39 F.R. 14594, April 25, 1974). Several manufacturers stated the minimum specification could degrade belt effectiveness in a crash. These manufacturers argued that the specification would preclude a belt, particularly a lap belt, from fitting securely around the occupant. This could result in the occupant "submarining" under the belt during a crash.

### **Motorized Track Systems— Webbing/Head Clearance**

Some automatic belt designs rely on overhead, motorized track-puller systems instead of the open-

ing of the door to move the webbing automatically out of the occupant's way when getting in and out of the vehicle. These systems pull the webbing toward the dashboard when the vehicle door is opened and then pull it toward the rear of the vehicle to deploy around the occupant after the door is closed. If such a system is used, the vehicle design should be such that the belt webbing does not pass too close to the occupant's head during its movement. Webbing that passes too close to or brushes the occupant's face or head could be annoying or disconcerting (perceived as hazardous by the intended user) and cause the occupant to defeat the automatic belt system (by unbuckling or cutting the belt, for example). The proposal specified a webbing/head clearance envelope that was intended to ensure that a moving torso belt would not come within a certain specified distance of an occupant's head and face.

Industry objected to this proposed requirement on the basis that many small vehicle models could not comply with the requirement without substantial changes to the vehicle structure (i.e., because of limited head room in these small cars). Toyota Motor Company stated that an automatic belt design it has already introduced in the market would have to be withdrawn if this proposed requirement were finalized because there is not sufficient room in its vehicle model to obtain the specified clearance. Volkswagen stated that any specification for webbing/head clearance should only specify that the webbing cannot touch the occupant's face while it is articulating, and that a minimum distance specification is too design restrictive. General Motors stated that the spherical zone specified in the proposal falls outside the vehicle on some GM body styles, and would thus preclude motorized belt systems in these vehicles.

### **Rate of Movement of Motorized Belts**

The agency stated its belief in the proposal that motorized belt systems will be unacceptable to the public if the rate of belt movement is too slow, since the occupant would be delayed in exiting the vehicle. Systems that move too rapidly might also be unacceptable since they could be viewed by vehicle occupants as a possible hazard. Each of these problems could lead vehicle occupants to defeat the automatic belt system. Therefore, the proposal specified minimum and maximum times allowed

for belts to move forward and backward on motorized track systems (between 1.5 and 1.9 seconds from start to stop).

Manufacturers stated that this proposed specification should be deleted because of the variation in performance of motorized systems due to environmental conditions. The comments pointed out that ambient temperature greatly affects motor speeds and battery conditions and that the movement time, therefore, could not be held stable. Several commenters argued that a single movement time is impractical because of the wide variety of vehicle sizes and the varying distances a belt system would have to move. The commenters stated that if such a requirement is retained it should be stated as a rate rather than total times allowed. In this way, the movement of all systems would be uniform even though it would take longer for the belt webbing to move down the track in a large vehicle than in a small vehicle.

### **Agency Response to Comments on Unadopted Proposals**

The agency does not agree with the general negative response of most vehicle manufacturers regarding the relationship between seat belt comfort and convenience and belt use. Likewise, the agency believes that the specification in the notice of proposed rulemaking would greatly improve the comfort and convenience of seat belt systems, particularly the new automatic belt systems that will be introduced in the future. Although the agency agrees that many factors influence belt use, it continues to believe that belts which are inconvenient to use and uncomfortable to wear will be used less regardless of these other factors. The research studies cited in the notice of proposed rulemaking clearly establish that there is a definite problem with many current seat belt designs, and that seat belt systems can be improved with relatively minor changes. Removing the most egregious problems with seat belt designs will, at a minimum, remove an impediment that currently thwarts other programs designed to increase seat belt use. For example, seat belt education campaigns will have little effect if people attempt to wear the belts but find them inconvenient and uncomfortable.

The agency also does not agree with many of the comments regarding specific provisions included in the proposal. Proper torso belt fit is an extremely important aspect of ensuring that belts are com-

fortable to wear and do not cross the neck or face. The problems cited by the industry with the proposed specification and test procedure are problems the agency believes can be solved. While it is true that some vehicle models may require significant modifications to comply with the fit zone, the agency believes that this is due primarily to the fact that in the past vehicles have been designed with little attention given to how the belt system will fit when installed in the vehicle. Belt systems are typically added as an afterthought long after the vehicle's structural design has been completed, with no systematic effort to coordinate a particular belt design to a particular structural design.

The industry's comments that webbing/seat clearance for automatic belts will not be a problem after occupants learn how to get into the vehicle only address part of the problem. In the months since issuance of the proposal, the agency has observed many prototype and production automatic belt designs. These observations have demonstrated that webbing/seat clearance is extremely important to ensure that the belt webbing does not scrub across the occupant's clothing when entering the vehicle. Some of the designs that were observed had such minimal clearance that buttons and shirt pocket contents were snagged by the belt system as an occupant entered the vehicle. This is obviously a problem that would encourage disconnection of the belt system. In addition, if the webbing/seat clearance is so minimal that the person has to manually move the belt out of the way to enter the automobile, the system is not really "automatic" and would not satisfy the automatic restraint requirements of the standard. The agency has concluded that these problems outweigh the perception problem discussed in the proposal. Consequently, the agency believes that the 3-inch specification in the proposal is inadequate and a greater clearance is desirable. While it is true that greater clearance may require innovative designs, the agency believes these are problems that can and should be solved.

Although these basic disagreements do exist between the NHTSA and vehicle manufacturers, the agency does believe that many of the specific comments to the proposal have merit. Also, the agency is aware that many of the problems cited by the industry are legitimate concerns. The agency is cognizant of the fact that there are a multitude of vehicle configurations that would have to be dealt



with in complying with all of the provisions included in the notice of proposed rulemaking. In certain situations it may be true that strict compliance with the provisions as originally specified might compromise belt effectiveness in crashes to a limited degree, if applied to existing, unchanged structural configurations. Most manufacturers stated that the injury criteria of the standard could be met under the specifications of the proposal, but that in some instances the margin of safety would not be as great. Obviously, the agency does not want belt system performance to be degraded in the attempt to make belts comfortable and convenient enough that they will be used. However, the agency does not believe that such a compromise is necessary if belt system design and vehicle structural design are coordinated at the outset.

The agency has also considered the numerous comments concerning the leadtime that would be necessary to implement the proposed requirements in certain vehicle models, as well as the costs associated with making the changes after design plans have already been completed.

These considerations and the factors mentioned below have led the agency to conclude that requirements for torso belt fit, webbing/seat clearance, webbing/head clearance, and motorized belt track speed should not be included in this final rule. The agency believes that manufacturers should be encouraged to rapidly develop innovative automatic belt designs that will coordinate belt comfort and convenience and belt effectiveness to the greatest extent possible. In some vehicle configurations, particularly in smaller cars, strict compliance with the proposed specifications mentioned earlier may hamper these efforts. While the agency believes that it is possible and desirable to design comfortable and convenient safety belts meeting all of the proposed specifications, it does not wish to retard the introduction of automatic restraints because of minor technical problems in particular vehicle configurations. If all of the proposed requirements were issued in this final rule, additional leadtime would have to be given because of the special problems in a few vehicle models. The agency believes it is preferable to encourage voluntary compliance with some of the proposed provisions so that a majority of vehicles can be introduced at an earlier date with the comfort and convenience features incorporated.

The agency also intends to continue development of the proposed specifications in order to refine comfort zones and test procedures. Although the provisions as proposed would represent an important improvement in seat belt comfort and convenience if incorporated in current vehicle designs, comments from the industry have led the agency to conclude that some modifications and adjustments in the specifications may be desirable. Instead of delaying the introduction of improvements in seat belt design while the agency continues this development work, it has been determined that it is wiser to urge voluntary compliance with the major provisions included in the proposals so that they may be introduced as soon as possible. As automatic belts are introduced in the market, valuable data will be received concerning consumer perception of comfort and convenience. These data will be helpful to both the agency and the industry in further improving the belt systems.

Another factor influencing the decision not to include the proposed specifications in this final rule is the fact that there are automatic belt designs currently in production that do not comply with all the provisions proposed. The agency does not wish to preclude the continual production of these designs because, for example, they are  $\frac{1}{4}$  inch outside the torso belt fit zone. This is particularly true since the automatic belts currently on the road were introduced voluntarily by the manufacturers prior to the effective date of the standard.

As stated earlier, the agency does urge manufacturers to voluntarily incorporate the performance specifications that were proposed but that are not included in this final rule. The agency believes all of the provisions deal with seat belt design features that substantially affect the comfort and convenience of seat belt systems, and therefore help determine whether a particular belt system will be worn. The agency also believes that the provisions adequately specify performance criteria and that manufacturers can design systems that are in conformity with the specifications and that also optimize belt effectiveness in crash situations. Although some variations may be required for specialized vehicle configurations, the great majority of the specifications should prove to be extremely helpful to manufacturers attempting to develop seat belt designs that are comfortable to wear and convenient to use.



In order to aid both seat belt manufacturers and vehicle manufacturers, the NHTSA will publish in a later *Federal Register* notice suggested performance guidelines for torso belt fit, belt/head clearance, belt/seat cushion clearance, and speed of motorized belt track systems. The agency will also include in that notice tabulation of all research reports, studies and other data concerning the improvement of seat belt comfort and convenience that are available at the National Highway Traffic Safety Administration. The agency urges all manufacturers to use the information that is available and to incorporate these performance guidelines so that vehicle occupants will not be discouraged from using seat belts because of their discomfort or inconvenience.

### **Provisions Included in This Amendment**

In addition to the provisions discussed already, the notice of proposed rulemaking included specifications dealing with seat belt guides, torso belt pressure, latch plate accessibility, adjustable buckles for certain belts having emergency-locking retractors, convenience hooks for automatic belts, emergency-locking retractors in lap belts, belt retraction and belt comfort devices. The proposed provisions relating to these topics were intended to alleviate some of the most serious problems with current seat belt designs. Most manufacturers agreed that there are problems in these areas, although there was not total agreement on all of the remedies specified in the proposal. After considering the comments, the agency has concluded that improvements in these areas can and should be made. The changes required by this amendment are not burdensome and can be accomplished rapidly. The major objections of the industry to the proposal related primarily to the proposed provisions that are not being included in this amendment (discussed earlier in this notice).

### **Seat Belt Guides**

Seat belt webbing and buckles in motor vehicles often fall or are pushed down behind the seat. Consequently, occupants are discouraged or actually precluded from using the belts. Therefore, the proposal specified that belt webbing at any designated seating position shall pass through flexible stiffeners or other guides in the seat cushion to ensure that the belts are easily accessible to occupants. The provision also specified that belt buckles and

latchplates are to remain above the rear cushions at all times, even in folding or tumbling seats, and that all buckles are to be "free-standing" to allow one-hand buckling. These provisions were included in response to a petition for rulemaking submitted some time ago by the Center for Auto Safety.

The American Seat Belt Council supported the proposed requirements for both seat belt guides and "free-standing" buckles. Vehicle manufacturers requested that several changes be made in the specification or that it be deleted altogether. Volkswagen stated that it would be difficult to comply with the requirement for seats that both fold and tumble and for seats designed to convert into beds. The agency believes that suitable designs can be developed to ensure that belts remain above seats that both fold and tumble. Two vehicles were furnished by Volkswagen which showed two different rear seat configurations. The agency determined that belts could be developed for either that would comply with the provision. However, one design configuration would require seat-mounted belts, with a considerable increase in cost for the belts and increased weight for the vehicle. Based on its consideration of available designs and their costs, NHTSA has concluded that the cost of requiring seats that both fold and tumble seats to comply with the requirement may not be justified. Therefore, this type of seat is not subject to this amendment.

Several manufacturers stated that the proposed requirement should not apply to fixed seats since the purpose of the requirement can be accomplished without guides or conduits for fixed seats. The agency disagrees. The problem addressed in this proposed requirement has been most prevalent with fixed seats. Latchplates and buckles that get lost behind fixed seat cushions are more difficult to retrieve than buckles behind movable seats. While it is true that fixed seats can be designed so that there is little clearance between seat backs and seat cushions, buckles and latchplates can still be forced down behind the seat when a person sits on the seat.

The proposal specified that the belt latchplate and buckle must remain in fixed positions in relation to the seat cushion and vehicle interior. Several manufacturers pointed out that the belt hardware could not remain in a "fixed" position with adjustable seats. The agency agrees that this aspect of the provision was inaccurately stated.

The intent of the provision was only to require that the belt hardware pass through guides or conduits to maintain the location of the buckle and latchplate on top of the seat cushion. The provision is modified accordingly in this amendment.

Several manufacturers also objected to the specification for the "freestanding" buckles and "one-hand" buckling on the basis that the criteria is design restrictive and not stated in objective terms. The agency continues to believe that these provisions would increase the convenience of buckling a seat belt. Nevertheless, after considering the comments, the agency has decided that the specification would be difficult to enforce and may be too design restrictive in some instances. Additionally, a majority of vehicle manufacturers have already begun using stiffeners and other devices to make buckling of belts more simple. If this trend continues, a provision regarding this aspect of belt performance will not be necessary. Therefore, the agency is not including a requirement for "freestanding" buckles in the amendment at this time. The agency does urge, however, manufacturers to voluntarily design their belt system so that buckles are "freestanding" or of some other design that facilitates easy buckling by consumers.

#### **Torso Belt Body Contact Pressure (Manual and Automatic Belts)**

NHTSA research indicates that occupants are likely to complain about belt pressure if the torso belt net contact force is greater than .7 pound. Therefore, the proposal specified that the torso portion of any belt system shall not create a contact pressure exceeding that of a belt with a total net contact force of .7 pound.

Most manufacturers objected to the belt contact force limitation. Many commenters stated that the agency has not adequately demonstrated that .7 pound of belt webbing force is the optimum upper limit in all seating configurations. In lieu of the proposed limitation, various manufacturers suggested force limitations ranging from 1 pound to 11 pounds. Manufacturers also argued that the .7-pound pressure does not allow for engineering tolerances. Ford stated that its tests using the proposed procedure indicate that test variability amounts to  $\pm .3$  pound. Other manufacturers stated that the proposed force level is so low that it would be difficult to also meet the proposed requirement that belts retract completely when un-

buckled by the vehicle occupant, i.e., the retractor forces would have to be too low to meet the "self stow" provisions. Chrysler Corporation and General Motors stated that a more precise test procedure for measuring belt contact force is needed. This comment was echoed by several foreign manufacturers.

The agency does not agree with most of these objections. In a detailed study conducted by Man Factors, Inc., webbing retractor forces were varied in an experimental belt system mounted in a production vehicle. A series of male and female test subjects experienced each force level during on-the-road driving tests and reported whether the pressure felt was satisfactory or too great. That study showed that belt pressure greater than 0.7 pound was unacceptable to more than 60 percent of the test subjects. Therefore, manufacturers' comments that belt pressure should be as high as 1 to 11 pounds have little, if any, credence. Regarding other comments, the study that was conducted to determine maximum tolerable belt pressure was not conducted for a myriad of seating configurations since a given belt pressure will likely be either acceptable or unacceptable to an occupant regardless of the seating configuration. In automobiles that presently meet this pressure requirement, retraction has not been found to be a problem. Their belts retract in compliance with the proposed retraction requirements. The agency believes that comments stating that a test procedure should be included in the standard to measure the belt pressure have merit. Therefore, this amendment specifies a .7-pound maximum pressure limitation and includes a procedure for measuring belt pressure.

#### **Latch Plate Accessibility**

As noted in the proposal, one of the most inconvenient aspects of using many current seat belt designs is the difficulty that seated occupants have in reaching back to grasp the belt latchplate when the belt is unbuckled and in its retracted position. The greater the difficulty in reaching the latchplate to buckle the belt, the more likely that belt usage will cease or never begin. Poor accessibility of latchplates results from two main factors: Location of the latchplate beyond the convenient reach of some seated vehicle occupants, and inadequate clearance between the seats and side of the vehicle to allow easy grasping of the latchplate.



The proposal specified requirements to define limits on reach distance for latchplates and to prescribe minimum clearances for arm and hand access.

There were several comments from the vehicle manufacturers recommending changes in the proposed specifications. The proposed test procedures for this provision specified that the vehicle seat is to be placed in its forwardmost position when testing for compliance with the reach envelope (the position in which there would presumably be the most problems). Ford Motor Company stated that the requirement should be modified to specify that the seat be located in the mid-track position since a 50th percentile adult would not normally have the seat in the forwardmost position (the proposal specified that a 50th percentile dummy be used to test for compliance with the reach envelope). The NHTSA agrees that some difficulty may be encountered in placing the 50th percentile test dummy in the forwardmost seat adjustment position. If this occurs, there is nothing that would preclude manufacturers from removing the test dummy's legs, since legs are irrelevant to the arm reach envelope. However, the agency believes that the requirement should specify that the seat be in its forwardmost adjustment position since many current latchplates are blocked with the seat in this position although they are not when the seat is in its mid-position. Since a significant number of vehicle occupants will have the seat in the forwardmost position (particularly women), the agency believes that the latchplate should be within easy reach for these occupants or they will be discouraged from wearing the belt system.

One manufacturer stated that it is not clear from the proposal whether the latchplate access specifications would apply to all seats or to just the front outboard seating positions. The requirement applies only to the front outboard seats, and the specification is modified in this amendment to clarify this point. Several commenters stated that the size of the test block used to measure latchplate access should be modified and that the block should be designed to articulate to represent the forearm and wrist of a human being. The agency does not agree with this recommendation. This size of the test block was designed to account for the limitation of the human arm and hand as they would articulate through various openings (in this case, between the seat and vehicle structure). The

dimension was based on a detailed study conducted by Man Factors (See DOT-HS-7-01617, December 1978). The agency also believes that the test apparatus would be unnecessarily complicated if specifications were included for articulation. For these reasons, the test block specification and test procedure is unchanged in this notice, except for minor technical changes in the string dimensions and the deletion of one illustration (Figure 3) that was included in the proposal. These minor technical changes are in response to comments and are included for clarification purposes.

#### **Convenience Hooks for Automatic Belts**

Some automatic belt designs might include a manual "convenience hook" located, for example, on the dashboard near the A-pillar, which would enable occupants to manually move the belt webbing totally out of the way as they are about to exit the vehicle. These devices would only be permitted as additional equipment since automatic belts must operate automatically, i.e., manual hooks could not be used as the sole means of moving the belt webbing out of the occupant's way. The proposal specified that if manufacturers install such "convenience hooks," the hook must automatically release the belt webbing so that it will deploy around the occupant prior to the vehicle being driven. The proposal specified that the hook would have to automatically release the webbing when

(a) The vehicle ignition switch is moved to the "on" or "start" position.

(b) The vehicle's drive train is engaged.

Manufacturers did not object to the proposed requirements for "convenience hooks," although there were several comments that the provision needs clarification. Jaguar Rover Triumph, Inc. stated that it is not clear from the proposal whether conditions (a) and (b) mentioned in the preceding paragraphs are sequential or alternatives. This notice modifies the language of the requirement to clarify that the "hook" must release the belt webbing when the ignition switch is in the "on" or "start" position *and* the vehicle's drive train is engaged at the same time (i.e., when both condition (a) and (b) exist at the same time). An optional condition "(c)" is added in response to a comment by American Honda Motor Co. to allow vehicles with manual transmissions to have the "hook" release the webbing when the ignition is on *and* the vehicle's parking brake is released at the same time.



## **Belt Retraction**

Many persons find seat belts inconvenient because the belt webbing will not retract completely to its stowed position when the system is unbuckled, so that the webbing is an obstacle when the occupant is trying to exit the vehicle. Therefore, the proposal included a specification to ensure that belts do retract completely and automatically when they are unbuckled. While there were no serious objections to the proposed requirement, several manufacturers requested changes in the test procedures. For example, it was requested that manufacturers be allowed to remove the arms on the test dummy during the compliance test since the belt webbing can get hung-up on the dummy's arms while retracting. The agency believes that this suggestion has merit since a human occupant can move his arm out of the way when a seat belt is retracting and that flexibility cannot be incorporated in the test dummies currently available. Manufacturers also requested that the test be conducted with the vehicle door open, since some systems are designed to automatically retract when the door latch is released (i.e., the retraction force is stronger in this mode). The agency agrees with this suggestion also, and it is incorporated in this notice.

## **Automatic Locking Retractors**

Seat belts incorporating automatic locking retractors (ALR's) in the lap belt portion of the system have been identified as a major item of complaint by vehicle occupants because of the feature's discomfort and inconvenience. Many vehicle occupants report that belts incorporating the ALR's tighten excessively under normal driving conditions, making it necessary to unbuckle and refasten the lap belt to relieve pressure on the pelvis and abdomen. This discomfort causes many persons to stop using their belts.

Belt systems having ALR's have also been found very inconvenient to use, particularly if the ALR is incorporated as part of the latchplate assembly. During the process of putting the belt on, the occupant must extend the belt in a single continuous movement to a length sufficient to allow buckling. Otherwise, the retractor locks before sufficient webbing has been withdrawn to accomplish buckling, and the belt has to be fully retracted before the occupant can repeat the donning process. Many persons have found this characteristic of

ALR's extremely irritating and consequently have avoided use of the belt. In addition, ALR's inhibit the driver's normal movement to pay tolls, reach the glove compartment, etc. With emergency locking retractors (ELR's) instead of automatic locking retractors, these problems would be alleviated.

Safety Standard No. 208 currently requires lap belts at outboard seating positions to be equipped with either automatic locking retractors or emergency locking retractors, in order to assure that belts are sufficiently tightened to be effective during a crash. However, this effectiveness feature can be achieved by ELR's without the concomitant discomfort and inconvenience associated with ALR's. Therefore, the proposal sought to eliminate ALR's as an alternative in the standard for front outboard designated seating positions.

The proposal also specified that emergency locking retractors for the lap belt portion of the belt system at the front outboard passenger's position shall be equipped with a manual locking device so that child restraint systems can be properly secured. Since emergency locking retractors allow some movement when the belt is fastened, the agency and some child safety experts were concerned that the child restraint system could slide out of position prior to a crash if the retractor cannot be manually locked.

Few manufacturers objected to the requirement that lap belts at front outboard designated seating positions be equipped with emergency locking retractors. However, nearly all manufacturers objected to the requirement that these emergency locking retractors be equipped with a manual locking device for securing child restraint systems. Ford Motor Company stated that the manual lock requirement is design restrictive and will preclude the installation of continuous loop manual belts and certain three-point automatic belts. Also, Ford stated that the proposed requirement is inconsistent with another proposal precluding any device that allows the introduction of slack in a belt system (e.g., comfort devices). Ford argued that the manual lock could be used to introduce excessive slack in the belt when worn by an adult. Toyota Motor Company stated that an emergency locking retractor is definitely superior to an automatic locking retractor from the standpoint of comfort and convenience. Toyota argued, however, that its tests with the GM child seat (braking, fast cornering, driving on rough roads)

have demonstrated that the performance of emergency locking retractors in restraining this child seat is satisfactory without a manual locking device.

The Motor Vehicle Manufacturers Association pointed out that the Economic Commission of Europe (which sets international motor vehicle safety standards) does not even permit manual locking devices on emergency locking retractors. Volkswagen of America stated that the proposed requirement would impair the operation of these belts by allowing too much slack in the system, and argued that parents should be encouraged to place their child restraints in rear seating positions that have automatic locking retractors. General Motors argued that the agency's data is totally inconclusive in demonstrating that emergency locking retractors without locking devices cannot adequately secure child restraint systems. General Motors cited its own tests which it states demonstrated child restraints are adequately secured with emergency locking retractors. Finally, several manufacturers stated that the manual locking devices could pose a hazard in emergency situations if the emergency locking retractor is located on the vehicle door. These commenters pointed out that the vehicle door would be impossible to open from the outside if the retractor is locked.

After considering these comments, the agency has decided that while emergency locking retractors should be required for lap belts at front outboard designated seating positions, these retractors should not be required to have manual locking devices. The agency believes that the points raised in the comments represent legitimate concerns. Further, agency tests conducted after the issuance of the proposal indicate that there may not be a substantial problem with Type 2 belts incorporating emergency locking retractors restraining child seats. However, the agency is planning to conduct further research regarding the use of Type 1 belts with ELR's to secure child restraints. Additionally, the agency recently issued a proposal to amend Safety Standard No. 210, *Seat Belt Anchorages*, to require that lap belt anchorages be present at front outboard seating passenger positions that are not equipped with lap belts (e.g., vehicles equipped with a two-point, single diagonal automatic belt). Therefore, if that proposal is adopted, parents wishing to place child seats in front seating positions in the affected vehicles can

purchase a lap belt having an automatic locking retractor or a manual webbing adjusting device. In light of these considerations, and the cost of installing manual locking devices on emergency locking retractors, the manual locking device of the proposal is not adopted.

The proposal also included a provision to allow manual adjustment devices on seat belt assemblies in rear seating positions that have emergency locking retractors. Although automatic locking retractors are allowed in rear seating positions, some manufacturers are currently installing emergency locking retractors. These manufacturers have requested that manual webbing adjustment devices be allowed on these belt systems, specifically for facilitating the securement of child restraint systems. Nearly all commenters agreed with this provision and it is included in this amendment.

In summary, although manual locking devices are not being required on emergency locking retractors in front seating positions, these devices or manual webbing adjustment devices are being allowed in rear seating positions. The manual webbing adjustment device would not be permitted in front seating positions, but manufacturers would be permitted to voluntarily install manual locking devices on belts in front seating positions.

#### **Devices That Introduce Slack in Belt Webbing**

Some current seat belt designs include devices that are intended to relieve shoulder belt pressure. These "comfort clips," "window-shade" devices, or other tension-relieving devices can reduce the effectiveness of belts in crash situations if the occupant uses the device to put excessive slack in the belt webbing, i.e., so that the belt is not snugly against the occupant. Therefore, the proposal included a provision to prohibit any device, either manual or automatic, that would permit the introduction of slack in the upper torso restraint. The proposal stated that such devices would not be necessary to relieve the discomfort caused by excessive belt pressure since the proposal also included a limitation on belt pressure.

Several manufacturers objected to an outright ban on tension-relieving devices. The American Seat Belt Council stated that an appropriate performance requirement should be developed that will allow a small, controlled amount of slack in belt systems. General Motors stated that its tension-



relieving devices allow some slack but that this slack could not be introduced inadvertently. General Motors argued that such devices should be allowed provided the slack is cancelled when the vehicle door is opened, i.e., so that there is no slack at all when an occupant uses the belt on a subsequent occasion. The commenters argued that some persons do not like any belt pressure at all, not even the .7 pounds that would be the maximum allowed under the proposed belt pressure provisions.

The agency believes there is some merit to these arguments particularly in regard to automatic belt systems that are required to comply with the injury criteria of Safety Standard No. 208. Therefore, tension-relieving devices are not prohibited in this amendment in automatic belt systems provided the belt system can comply with the injury criteria of the standard with the belt placed in any position to which it can be adjusted. This means that if six inches of slack can be introduced in the automatic belt system by means of the tension-relieving device, the belt must be able to comply with the injury criteria with the belt webbing in that position. Since manual seat belt systems are not required to comply with the injury criteria of the standard generally, they would also not be required to comply just because they include tension-relieving devices. The agency does urge manufacturers to voluntarily limit the amount of slack that can be introduced in their manual belt systems, however.

### **Seat Belt Warning System**

The proposal included a provision for a new sequential seat belt warning system in all motor vehicles which are not passenger cars and which have a gross vehicle weight rating of 10,000 pounds or less.

Safety Standard No. 208 currently requires a visual and audible warning system to remind vehicle occupants to fasten their manual safety belts. The present standard requires a warning system which activates, for a period of 4 to 8 seconds, a reminder light each time the vehicle ignition is operated, and an audible warning if the driver's lap belt is not in use. Studies of manual seat belt usage in passenger vehicles have shown that a sequential logic system which incorporates a visible reminder light of continuous duration and a 4- to 8-second audible warning could produce usage rates significantly greater than those obtained with the warn-

ing systems currently required. The sequential logic warning system activates unless buckling of a person's belt occurred after the person sat down in his seat. Under the current 208 requirement, the warning system can be permanently defeated if the belt is buckled and pushed behind the seat cushion and left there during subsequent occasions on which the vehicle is used.

Only the American Seat Belt Council supported the requirement for a sequential warning system. The vehicle manufacturers uniformly objected to the requirement, stating that such a system would cost \$25 to \$35 per vehicle (this is much higher than the agency's estimated cost figure). Also, manufacturers disputed the agency's data and argued that there is no documentation demonstrating that a sequential warning system will substantially increase belt use in vehicles other than passenger cars.

The agency agrees that the data relied upon in the proposal dealt primarily with sequential warning systems in passenger cars (The Phoenix Study, DOT-HS-801-953). There is no conclusive evidence that such a system would also improve seat belt use in light trucks and vans to a comparable degree. Although the agency is convinced that an effective warning system similar to or like that proposed would result in some increased seat belt use in these other vehicles, the agency has concluded that manufacturers should be allowed to voluntarily install such systems under an implementation schedule suited to particular vehicle models in order to minimize costs. Therefore, the proposed requirement is not included in this amendment. Specifications for a sequential warning system will, however, be included in the voluntary performance guidelines that will be issued in the near future, however, for the benefit of manufacturers that are interested in such a system.

The proposal also included a specification for warning systems for automatic seat belts, to ensure that motorized systems are locked into place before the vehicle begins moving. If for some reason the motorized belt has not returned and locked into its protective mode, the occupant would be alerted by the continuous light and by a 4-to 8-second audible warning. Although several manufacturers objected to this requirement, again primarily because of cost, the agency believes such a requirement is essential for motorized automatic



belt systems. It is therefore included in this amendment.

The proposal also included an illustration chart specifying the weights and dimensions of various human body sizes (e.g., 5th percentile female). The comments to the proposal indicated that some persons were confused about inclusion of the chart. Some commenters interpreted the figures in the chart to represent a change in the Part 572 dummy dimension. The chart was included in the proposal to be republished in the standard since it had been inadvertently deleted by the *Code of Federal Regulations* some time ago. The chart, however, was not intended to make any changes in the Part 572 test dummy.

In order to give manufacturers sufficient lead time to implement the changes required by this

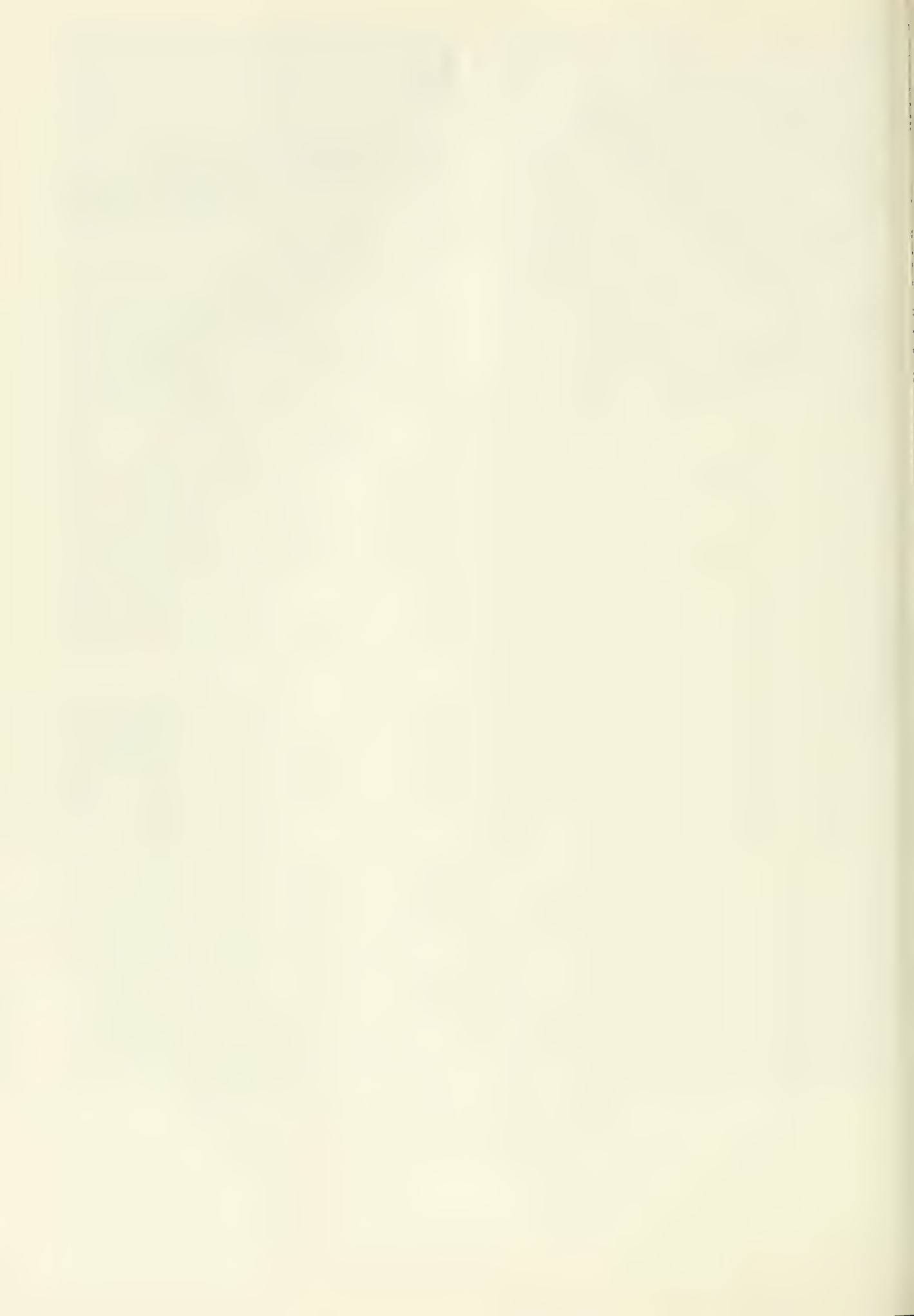
notice, and to minimize the cost of such changes, the effective date of this amendment is September 1, 1982.

**Note**—The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12221, "Improving Government Regulations," and the Departmental guidelines implementing that order. Therefore, a regulatory analysis is not required. A regulatory evaluation concerning the amendment has been prepared and placed in the public docket under the docket number and notice number of this *Federal Register* notice.

Issued on December 31, 1980.

Joan Claybrook,  
*Administrator.*

**46 F.R. 2064**  
**January 8, 1981**



# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208**

## **Occupant Crash Protection (Docket No. 208; Notice 21)**

**ACTION:** Final rule.

**SUMMARY:** The purpose of this notice is to amend Safety Standard No. 208, Occupant Crash Protection, to delay for one year the effective date of the first phase of the automatic restraint requirements of the standard. Prior to this notice, the automatic restraint requirements were scheduled to become effective for large cars on September 1, 1981 (model year 1982), for mid-size cars on September 1, 1982 (model year 1983), and for small cars on September 1, 1983 (model year 1984). As amended by this notice, the requirement for equipping large cars with automatic restraints will not take effect until September 1, 1982, or model year 1983.

This one-year delay in the automatic restraint requirements is being specified in light of dramatic changes in production plans for the model-year 1982 fleet (fewer large cars and more small cars) and because the economic and other justifications for the existing phase-in schedule have changed drastically since the standard was adopted in 1977.

The one-year delay will also allow the Department sufficient time to re-evaluate the entire automatic restraint standard as required by the Presidential Executive Order 12291 (February 17, 1981). The Department is simultaneously issuing a notice of proposed rulemaking in today's issue of the *Federal Register* discussing further possible changes in the automatic restraint standard.

**DATES:** The new effective date of the automatic restraint requirements for large cars is September 1, 1982.

**ADDRESSES:** Any petitions for reconsideration should refer to the docket number and notice number of this notice and be submitted to: Docket

Section, Room 5109, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

### **FOR FURTHER INFORMATION CONTACT:**

Mr. Michael Finkelstein, Office of Rulemaking,  
National Highway Traffic Safety  
Administration, Washington, D.C.  
20590 (202-426-1810)

**SUPPLEMENTARY INFORMATION:** On February 12, 1981, the Department of Transportation issued a notice of proposed rulemaking to delay for one year the first phase of the automatic restraint requirements of Safety Standard No. 208, Occupant Crash Protection, (46 FR 12033). Automatic restraints are systems that require no action by vehicle occupants, such as buckling a seat belt, to be effective. Two existing systems that qualify as automatic restraints are air cushion restraints (air bags) and automatic seat belts (belts which automatically envelop an occupant when entering the vehicle and closing the door).

The automatic restraint requirements were added to Standard No. 208 on July 5, 1977 (42 FR 34289), and require installation in accordance with the following schedule:

- For full-size cars (wheelbase greater than 114 inches) beginning September 1, 1981 (1982 model year);
- For mid-size cars (wheelbase not more than 114 inches but greater than 100 inches) beginning September 1, 1982 (1983 model year);
- For small cars (wheelbase less than 100 inches) beginning September 1, 1983 (1984 model year).

The February notice issued by the Department proposed to alter this phase-in schedule by



deferring the first phase (large cars) for one year, from model 1982 to model year 1983. The proposal noted that such a change may be appropriate because of the effects of implementation in model year 1982 on large car manufacturers, because of the added significance which those effects assume due to the change in economic circumstances since the schedule was adopted in 1977, and because of the undermining by subsequent events of the rationale underlying the original phase-in schedule. (See the notice of proposed rulemaking for a full discussion of the facts which led to the proposed alteration of the phase-in schedule.)

#### **Comments Upon Proposal**

The responses to the proposal were equally divided between those commenters adamantly opposed to any delay in the automatic restraint requirement and those commenters in favor of both the delay and a total revocation of the requirements. The comments and data supporting these factions were as diametrically opposed as the competing economic interests involved, in this instance the automobile and the insurance industries. Following is a summary of the major comments submitted in response to the proposal. A more detailed summary of representative comments is included as an appendix at the end of this notice.

The automobile insurance industry was unanimously against the proposed delay in the first phase of the automatic restraint requirements, unless the standard is also amended to require an earlier implementation of automatic restraints for small cars (i.e., a delay and reversal of the current schedule). The commenting insurance companies stated that the automatic restraint requirements will save thousands of lives and prevent hundreds of thousands of serious injuries. They argued that the proposed delay of the 1982 requirements would, therefore, result in a significant number of fatalities and injuries that would not otherwise occur. These companies also argued that the monetary savings that would result from the proposed delay are so small that they would not significantly help the ailing automobile industry. The commenters pointed specifically to the fact that most of the capital expenditures have already been made for installing automatic restraints on 1982-model large cars.

In urging a reversal of the implementation schedule, the insurance companies noted the dramatically increasing number of small cars, and pointed to insurance research which shows small cars are inherently more dangerous for occupants than large cars. (NHTSA statistics show that a person is eight times more likely to be killed in a small car than in a full-size car in a crash between the two.) Since small cars will represent a majority of the 1983-model passenger car fleet, the companies argued that more lives could ultimately be saved if automatic restraints are required on small cars in that model year, than under the existing implementation schedule.

Many of these same sentiments were also voiced by consumer groups and health organizations, the majority of which were also opposed to the proposed delay of the MY 1982 requirements. Like the insurance companies, most of these groups asserted that usage rates for automatic belts will be relatively high and that the automatic restraint standard as a whole will save thousands of lives.

Several consumer groups and air bag component suppliers stated that they could support the proposed delay provided there is also a requirement that vehicle manufacturers at least offer air bags as options on some of their model lines. These groups are concerned that further delay of the automatic restraint standard will drive the remaining air bag component suppliers out of the market and that, as a result, the life-saving potential of air bags will be lost.

The insurance industry and a majority of the consumer groups argued that the benefits of the 1982-model year requirements outweigh the costs. A detailed analysis by Professor William Nordhaus of Yale University was submitted on behalf of several insurance companies. This analysis concludes that the economic costs of the proposed delay would be approximately five times greater than the benefits, for a net cost of \$200 million. These figures are based on computations regarding the societal costs of deaths and injuries that would result without the MY 1982 automatic restraint requirement.

Several of the commenting insurance companies and consumer groups also argued that as a matter of law and statutory authority the Department cannot rely on the general economic health of the automobile industry to justify a delay in

the automatic restraint standard. The National Traffic and Motor Vehicle Safety Act (the Vehicle Safety Act) (15 U.S.C §1381, *et seq.*) provides that motor vehicle safety standards shall be "reasonable" and "practicable." These commenters noted that the legislative history of the Vehicle Safety Act indicates that in promulgating standards, safety shall be the overriding consideration. The commenters contend that the current poor economic condition of the automobile industry does not make the 1982 model-year requirements impracticable.

In addition to comments from the above groups and organizations, the Department also received comments from numerous private citizens, who were equally divided in their support or opposition to the proposed delay.

The proposed delay in the 1982 model-year requirements was unanimously supported by the automobile industry, both foreign and domestic. In addition, most manufacturers urged the Department to reconsider the entire standard, to provide additional leadtime for all phases of the implementation schedule, or to revoke the automatic restraint requirements altogether. Regarding a possible reversal of the current implementation schedule, nearly all of the foreign automobile manufacturers joined Chrysler Corporation and American Motors in stating that it would be impossible to install automatic restraints on 1983-model small passenger cars because of insufficient leadtime.

In support of a complete rescission of the automatic restraint requirements, the vehicle manufacturers made several arguments. The manufacturers believe that automatic seat belts will be so unacceptable to the public that they will create a consumer "backlash" greater than that caused by ignition interlock devices required by NHTSA to be installed on 1974-75 models. These devices made it impossible to start the vehicle unless front seat belts were fastened, and were specifically precluded by the Congress by amendment to the Vehicle Safety Act in 1974.

The manufacturers contend that automatic seat belts will produce such a reaction because of their coercive nature and obtrusiveness. They also contend that automatic belts must be designed so that they are easily detachable (and presumably thereby more acceptable to the public). In such case, they argue that the usage

rate for automatic belts would be no greater than for current manual belts, and that the increased cost of automatic belts would not be justified.

Auto manufacturers also argued that the extremely high price of air bags makes them impractical, and allege that few will be installed on future passenger cars. Consequently, they contend, the only benefits attributable to the automatic restraint standard will be those derived from automatic belts, which for the above reasons will not be effective.

Only two vehicle manufacturers, Ford Motor Company and General Motors, produce any significant number of large cars. Therefore, the existing automatic restraint requirements for 1982 models would only directly affect these two companies.

Ford Motor Company supported the proposed delay and stated that it considers its original 1982-model, three-point automatic belt designs to be "out of date" because of their release concepts (i.e., they include a feature to frustrate release and thus defeat of the system). Ford believes this could lead to significant public dissatisfaction with MY 1982 automatic belts. In response to this concern, Ford had decided to add a conventional release buckle to this three-point belt, so that it can be detached by those motorists who refuse to wear a belt. Ford's submission stated that the company projects that as many as 100,000 purchasers would switch to mid-size cars in the 1982 model year rather than buying large cars with an automatic belt. Ford plans to redesign its automatic belts, but states that such a program has major leadtime implications which would make it impractical to install improved automatic belts in small cars before September 1, 1983.

General Motors Corporation stated that its planned 1982-model automatic belt designs are easily detachable (i.e., there will be a buckle release mechanism without an interlock or other mechanism to discourage defeat of the system). With this type belt, according to GM, the impact on safety will depend upon voluntary use of the automatic belt, so use would not likely be any greater than with current manual belt systems. Therefore, General Motors argues that the proposed delay should have only a minimal adverse safety impact.

General Motors stated that the proposed delay would result in a net increased sales revenue to



the company of \$760 million, and that the company could realize a savings of approximately \$13 million in capital investment for the 1982 model-year program. General Motors explained the \$760 million figure with the following rationale:

Automatic belts will be regarded by many as an unnecessary inconvenience, and they will deprive purchasers of six passenger seating capacity. Thus, 1982 full-size cars equipped with such a restraint will be at a competitive disadvantage in that consumers can avoid the penalties of increased cost and reduced accommodation either by purchasing vehicles not subject to passive restraint requirements in that year, or by deferring their purchases. The proposed delay will allow the consumer to purchase a full size car in 1982, without a cost penalty, which fully meets his needs and expectations.

General Motors' concern in this regard derives from the fact that large cars with automatic seat belts will be able to have only two front seating positions, since no company has developed an automatic belt system for the center seat position. With the automatic restraint requirements delayed, General Motors would be able to install bench front seats with three seating positions in its large cars. General Motors estimates that the reduced seating capacity thus caused by automatic belts will result in 120,000 fewer large car sales: 50,000 purchasers will shift from large cars to GM mid-size cars, and 70,000 potential purchasers will defer buying a new large car in the 1982 model year if they cannot obtain a six-passenger large car. General Motors contends that these factors will result in a revenue loss to the company of \$760 million if the automatic restraint requirements are not delayed.

#### **Rationale For Agency Decision**

The agency has given thorough consideration to all comments submitted in response to the proposed delay of the first phase of the automatic restraint requirements, and carefully analyzed all such information and data in the Record of this proceeding. The wide diversity among factual, analytical and policy-related positions urged by those supporting and those opposing the proposed delay illustrates the degree to which this

proceeding involves questions for which there are currently no concrete answers.

For example, the usage rate of automatic belts will be extremely dependent on the exact design of a particular belt system. Consumer expectations (for example, that six-seat cars will be available), consumer acceptance (for example, the purchase of cars with automatic belt systems which cost more than current belt systems) and actual rates of usage are values crucial to the Department's decision-making process. These factors, which are dependent on the desires and reaction of the American public, cannot be quantified or predicted with certainty.

On the basis of the record herein, the Department has concluded that the applicability of FMVSS 208 in MY 1982 to large cars would be impracticable and unreasonable. Requiring such compliance would reduce sales and profits, and increase unemployment, for the manufacturers of such vehicles. The Department believes that it is in the public interest to avoid these unnecessary costs and impacts by providing an additional year of leadtime.

The February 12, 1981 notice detailed many of the specific reasons which led to the proposed delay. As specified in that notice, many of the factual assumptions and premises which led to adoption of the phase-in schedule have been proven wrong by subsequent events. The economic situation of the industry and of consumers and the economy as a whole have drastically changed since the standard was adopted in 1977.

The current phase-in schedule for automatic restraints was intended to permit manufacturers to introduce automatic restraints without undue technological or economic risk. Such risks would otherwise have had to have been assumed contemporaneously with the risks involved in having to meet the requirements imposed by emission and fuel economy standards applicable to automobiles in the early 1980's.

Large cars were chosen for the first phase of the schedule because at that time there was more experience with air bags in such full-size cars. A phased schedule to cover progressively smaller cars, in stages, was adopted to provide manufacturers with a chance to gain similar levels of experience in smaller cars. To ensure that manufacturers would in fact have the maximum flexibility to choose between equipping smaller cars with air



bags or automatic belts, those cars were to be phased in last. This justification for a phased implementation schedule is no longer valid. Gasoline shortages, price increases (especially those occurring since the Iranian oil cut-off in 1979), and continuing uncertainty about levels of future petroleum supplies have led to dramatic increases in production plans for small cars. The small car share of new production is growing at a much faster pace than was anticipated by the Department when the automatic restraint requirements were issued.

In 1977, the Department projected that new car production in the model year 1982-1985 period would be approximately 24 percent large cars, 53 percent mid-size cars, and 23 percent small cars. However, NHTSA now estimates that actual production of large cars will be about 11 percent in model year 1982 while mid-size and small cars are expected to increase commensurately in that model year.

Thus, under the state of facts now facing the Department, about 11 percent of the 1982 model-year cars would be required to have automatic restraints under the 208 standard.

This major shift in the absolute and relative numbers of cars which would be subject to the first year of the standard will have important adverse impacts upon the benefits to be achieved by the first year of application of the standard. Consumer acceptance of the automatic restraints now anticipated to be used in the 1982 model-year cars is likely to be substantially less than was assumed in 1977. There will be more than a million fewer vehicles with automatic restraints than was previously expected. With fewer cars equipped with automatic restraints, the vehicles which are so equipped will be far more vulnerable to negative consumer reaction.

The Department has long recognized that any costly, arguably coercive restraint system will cause a certain percentage of the population to react negatively. The factors leading to such negative reaction will be magnified as the percentage of new 1982-model cars equipped with automatic restraints decreases. Adverse consumer preferences leading to deferral of the purchase of large cars, or to shifts to the purchase of mid-size cars, will predictably occur.

Concern about providing additional leadtime to adapt air bags to small cars is also less important

now as a result of changes in facts occurring since 1977. When the standard was issued, the Department assumed that manufacturers would equip a great majority of their vehicles (75%) with air bags in preference to belt systems. However, most manufacturers now indicate that they intend to offer air bags on very few of their large cars, and on almost none of their smaller cars. Almost all 1982 model-year cars are planned to use automatic belts.

The absence of any opportunity to select between automatic restraint systems will materially affect public acceptance of the automatic restraint standard. General Motors has pointed out that two automatic belt designs recently offered as options on its Chevette line produced very low purchaser interest, even though the cost was minimal and the car line was in high demand. GM states that fewer than 13,000 of 415,000 1980-model Chevettes sold were equipped with the automatic belt option, despite the fact that the option was offered at no cost to most purchasers, GM salesmen were to be given an additional commission of \$25 for each sale, and over \$1 million was spent on advertising and marketing.

Similar low interest has been shown in an automatic belt system offered as an option on General Motor's 1981 Cadillac.

The poor consumer acceptance of these automatic belt options substantiates the Department's assumption that automatic belts installed on only a limited percentage of a particular model-year fleet will have difficult public acceptance problems.

The public acceptance of 1982-model automatic restraints is a valid concern of the Department and is of primary importance in determining the reasonableness and practicability of the standard, and whether there is good cause for the delay. As stated by the Court of Appeals in *Pacific Legal Foundation v. Department of Transportation*, 593 F.2d 1338 (D.C. Cir.), *cert. denied*, 444 U.S. 830 (1979):

We believe that the agency cannot fulfill its statutory responsibility unless it considers popular reaction. Without public cooperation there can be no assurance that a safety system can "meet the need for motor vehicle safety." And it would be difficult to term 'practicable' a system, like the ignition interlock, that so annoyed motorists that they deactivate it.

The Department is unable to conclude from its current data, taking into account the large number of private citizens who took the time and effort to file comments reflecting their opposition to automatic restraints, that the 1982 automatic belt designs planned by the manufacturers will receive "public cooperation."

The proposal stated that the changed economic circumstances may make the current implementation schedule for automatic restraints impracticable. Several commenters argued that the general economic situation of the automobile industry is not a legitimate criterion for determining whether a safety standard is practicable under the National Traffic and Motor Vehicle Safety Act. The legislative history of the Vehicle Safety Act clarifies that economic considerations may be considered in determining the "practicability" of a particular safety standard:

This would require consideration of all relevant factors, including technological ability to achieve the goal of a particular standard as well as consideration of economic factors. (H.R. Rep. No. 776, 89th Cong., 2d Sess. (1966) at 16.)

One commenter stated that the term "practicable" must be viewed as relating solely to the economic and technological capability of the industry to meet the timetables established by the particular safety standard in question, and not to the general economic health of the industry. The Department disagrees with this reading of the Vehicle Safety Act and its legislative history.

The reasonableness and practicability of the current phase-in schedule cannot be determined in a vacuum. What is reasonable and practicable for a healthy firm or industry may not be for an ailing one. The proposal noted the current financial difficulties of the automobile industry. Vehicle sales remain at depressed levels and unemployment in the domestic industry is extremely high. Approximately 200,000 workers have been indefinitely laid off, and more have been temporarily laid off. These losses come at a time when the domestic manufacturers are spending unprecedented sums to meet the continuing demand for more fuel efficient cars.

The Department concludes further that economic hardship to the affected industry and individual companies must be balanced with all other considerations in determining the

"reasonableness" and "practicability" of a particular safety standard. None of the individual factors involved in the deliberations may properly be applied without regard to the other factors. This proposition holds both in promulgating a standard and in retaining a standard when relevant factors have materially changed since the standard was first adopted.

The same commenter also argued that the Department had not shown "good cause" for proposing to delay the effective date of the automatic restraint requirements, in light of the requirements of the Motor Vehicle Safety Act that the leadtime for the effective date of safety standards shall be no longer than one year, unless the Secretary finds, for good cause shown, that an earlier or later effective date is in the public interest (15 U.S.C. 1392).

The leadtimes associated with the existing implementation schedule were much longer than one year. These were upheld by the Court in the Pacific Legal Foundation case, *supra*. In that case, the court relied heavily on the inability of the manufacturers to comply with the requirement in one year's time, and on the need for considering the likelihood that the public will accept the change:

When dealing with a "technology-forcing" rule like Standard 208, the agency must consider the abilities of producers to comply with the new requirement and of the public to grasp the need for the change.

As was stated earlier, the Department is now concerned that 1982-model large cars might be seriously unacceptable to a large portion of the public.

The Department concludes that "good cause" exists for the proposed delay. The public interest in the economic viability of the industry and, with respect to the proposed delay, the particular circumstances of the manufacturers of the vehicles involved, requires that inequitable burdens and unnecessary costs be avoided where possible in implementing FMVSS 208. Large cars are not expected to be produced beyond MY 1985. Application of the standard to large cars in advance of smaller cars would thus involve such burdens and could involve such costs.

In addition to these considerations, the Department believes that the proposed delay must be



viewed as a separate regulatory action insofar as leadtime is concerned. The leadtime specifications for the existing implementation schedule were upheld by the court in *Pacific Legal Foundation*. The proposed delay represents a new consideration of the factors which will determine whether automatic restraints are reasonable and practicable for large cars in the 1982 model year, with primary attention being given to acceptability of these systems by the public.

Opponents of the proposed delay have pointed to the adverse safety impacts that might result, stating specifically that the safety benefits of the 1982 model-year requirements outweigh the costs. The Department's proposal stated that a delay of the first phase requirement could over the ten-year life of the vehicles involved result in a loss of 600 lives, and the accrual of 4,300 more injuries than would have occurred without the delay. After reviewing the information submitted in response to the proposal and analyzing more current data, however, the Department now concludes that its earlier estimate of adverse effects is invalid.

First, the assertion that 600 lives would be lost was based upon earlier estimates of benefits that would arise from 100 percent usage of automatic restraint systems. This calculation in turn had been based primarily on 1977 assumptions that air bags would be the technology of choice. As stated earlier, however, the Department now knows that very few air bags are planned for the 1982 model-year.

Unlike air bags, estimates of benefits arising from compliance with the automatic restraint standard by means of automatic belts must be based upon projected usage rates. The most optimistic expectations of automatic belt use for the 1982 model-year now appear to be a usage rate of 60 percent. Moreover, given the planned design of the 1982-model automatic belts, NHTSA now believes that a much lower usage rate will in fact occur. Both General Motors and Ford plan automatic belt designs which have a release buckle identical to the buckle on current manual belt systems. Motorists would therefore be able to disconnect the proposed belts with the same ease with which current active belt systems can be released. NHTSA believes it is likely that a large percentage of motorists would adopt this usage pattern, and detach the automatic belts.

Usage could thus in fact turn out to be low, and approach levels similar to that of current manual belt systems (7%).

The final regulatory analysis thus now includes a range of possible usage rates for 1982-model automatic belts, in analyzing possible benefits to be foregone by deferring the MY 82 standard for one year. If usage rates for the automatic belts otherwise required for that model-year were to be 15 percent, more than double the rate of use of current manual belts, retention of the 1982 requirements might save a total of 75 lives over the projected ten-year life of the large cars involved. If usage rates were to occur at the level of 60 percent, this number could possibly increase to as many as 490 lives over the same ten-year period.

NHTSA now believes that the potential usage of 1982-model automatic belt designs would more likely be near the bottom end of this scale. NHTSA data on observed usage rates for the belt systems employed in some models of the Volkswagen Rabbit, for example, are relevant. All such belts are optional, and were chosen by the purchaser either as a separate option or as a part of the "Deluxe" package. Moreover, the VW system employs an interlock mechanism, so that the engine may not be started if the system is not in place. Despite these factors, usage rates have been observed to be only 81%. That is, of the purchasers who specifically selected this optional system, nearly 20% thereafter in practice enter their vehicles, start their engines, and then deliberately disconnect the belt system when driving.

Moreover, actual accident data relating to such vehicles show even lower usage rates, of 55-57%. (See Regulatory Analysis, at V-11, 13 for discussion.)

After analyzing the data submitted in response to the proposal, the Department has determined that the one-year delay will result in a cost savings to consumers of approximately \$105 million. Capital investment savings for the industry will be about \$30 million. Net income available for reinvestment would be increased to \$292 million by the delay. Over 13,000 jobs will be saved in the automobile manufacturer and supplier industry, a savings of \$159 million. The basis for these figures is explained in detail in the final regulatory analysis. Given the current economic situation of the American public and the domestic



automobile industry, these savings are significant, particularly when viewed in conjunction with the Department's belief that the safety impact of the delay can be minimized.

While some measure of safety benefits will be foregone by this delay, the Department has concluded that such benefits are relatively minor. Moreover, the Department believes that any such loss of safety benefits can be offset with a coordinated effort by all parties involved. The Department believes that an intense seat belt use education campaign, joined by the Department, industry and consumer groups and targeted directly at the 1982 model-year cars, has the potential of affording even greater safety benefits than would otherwise accrue.

Finally, such a targeted campaign to increase the use of existing manual seat belts will provide further data on the viability of such strategies in increasing active seat belt use. Such information would be especially valuable for future rulemaking purposes, since it would in any event be at least ten years before all cars in the passenger fleet would be expected to be equipped with new safety equipment. Such information would enable the Department, State and local governments, and other interested parties to determine how to make the best use of their scarce resources to increase actual usage of the millions of manual seat belts that will remain on the nation's highways for years to come.

#### **Summary of Agency Conclusion**

The Department has determined that the existing schedule for the first year of implementation of FMVSS 208 is no longer reasonable or practicable. The assumptions leading to the 1977 rule are no longer valid. There will be few, if any, air bags installed in passenger cars because manufacturers have chosen automatic belts as the preferred means of compliance with the standard. The number of small cars on the road is increasing drastically and these cars are more unsafe than large cars. Yet, under the current implementation schedule, small cars are to be equipped with automatic restraints last.

The delay of the first phase of the automatic restraint requirements will enable the Department to adequately reassess the most viable alternatives for the occupant crash protection standard. The Department is publishing

simultaneously with this final rule a Notice of Proposed Rulemaking addressing alternatives to this standard, and attention is specifically directed to that proposal.

The Department is taking these actions because courts have found that the Department has a statutory responsibility to reexamine its safety standards in light of changing circumstances and new data. In those circumstances, the Department is required to make necessary revisions and schedule changes to ensure that the standards are practicable, reasonable and appropriate. As noted above, key assumptions underlying the issuance of the automatic restraint requirements in 1977 have been substantially undermined by subsequent events.

The delay and reevaluation of FMVSS 208 is also consistent with Executive Order 12291, which directs all executive branch agencies to delay final rules to the extent necessary to re-evaluate those rules under criteria specified in the Order.

This amendment has been evaluated as a major rule under the guidelines of new Executive Order 12291 and a final regulatory analysis is being placed in the public docket simultaneously with the publication of this notice. The major findings of that analysis have been discussed in the body of this notice.

The effect of the one-year delay has been evaluated in accordance with the National Environmental Policy Act of 1969. It has been determined that this action is not a major Federal action significantly affecting the quality of the human environment. An evaluation of the environmental consequences of the amendment is included in the regulatory analysis. Further information regarding environmental issues concerning automatic restraints, especially air bags, can be found in the environmental impact statements published in conjunction with the 1977 automatic restraint standard.

The regulatory analysis also includes a discussion of the Department's consideration of the possible impact of this amendment on small entities. The analysis shows that the one-year delay will have a minimal effect on the automatic seat belt-related firms, since it is likely that most of the 1982-model large cars will continue to be equipped with conventional manual type seat belts. Generally, however, the same firms

produce both automatic and manual belts, and none of these direct suppliers qualify as "small businesses" under the Regulatory Flexibility Act.

The effect of the delay on air bag suppliers is less certain. Neither Ford or General Motors would have installed air bags in 1982 vehicles regardless of the delay. The analysis determined that some suppliers of the air bag components will be adversely affected by the delay to some extent and that a few of these qualify as small businesses. However, it is doubtful that a substantial number of small businesses will be adversely affected by the delay to a significant degree.

The analysis also considered the effect of the delay on the small governmental units and other small fleet purchasers of cars. Since large cars are not generally sought for fleet purposes, the amendment is likely to have only a minimal effect on all types of small fleet purchasers.

In consideration of the foregoing, Safety Standard No. 208, Occupant Crash Protection (49 CFR 571.208) is amended as follows:

Section S4.1.2 is amended to read:

*"S4.1.2 Passenger cars manufactured from September 1, 1973, to August 31, 1983. Each*

*passenger car manufactured from September 1, 1973, to August 31, 1982, inclusive, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3. Each passenger car manufactured from September 1, 1982, to August 31, 1983, inclusive, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3, except that a passenger car with a wheelbase of more than 100 inches shall meet the requirements specified in S4.1.3. A protection system that meets requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3."*

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407).)

Issued on April 6, 1981.

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Andrew L. Lewis, Jr.  
Secretary of Transportation

46 FR 21172  
April 9, 1981

## APPENDIX

### DETAILED DISCUSSION OF COMMENTS

#### A. Comments Opposing the Delay

The insurance industry argued that the automatic restraint requirements will save thousands of lives and prevent hundreds of thousands of serious injuries. The League Insurance Companies stated that the proposed one-year delay would be "tragic and costly," adding that "there is a legitimate place for regulation when the need is great, the cost-benefit is demonstrably high, and the structure of the market place requires uniformity to be imposed on all manufacturers."

Allstate Insurance Companies argued that the growing proportion of small cars will increase deaths and injuries by 35 percent during the next four years, and that the only way to reverse this trend is by implementation of the automatic restraint standard. Allstate also argued that the proposal's analysis of the economic consequences of the scheduled implementation is based only on conjecture. The company stated that there is no substantial evidence of record that the proposed delay would provide any significant financial assistance to car makers. According to Allstate, however, the proposed delay would result in needless deaths and injuries at huge costs to society at large and to insurances-buying customers. Allstate concluded that it could only support a one-year delay in the automatic restraint requirements if the delay is coupled with a requirement that small cars comply with the standard in model year 1983 (i.e., one year earlier than the existing schedule). This sentiment was also expressed by the Alliance of American Insurers and the League Insurance Companies. Alliance stated that a move to install automatic restraints on small cars first is consistent with insurance research which shows small cars to be inherently more dangerous to occupants than large cars, and that such a change could also afford domestic manufacturers some economic relief.

State Farm Mutual Automobile Insurance Company attacked the proposed delay of the automatic restraint requirements on several grounds. First, State Farm argued that the record in this rulemaking proceeding demonstrates that full implementation of the automatic restraint standard will save thousands of lives and avoid tens of thousands of crippling and maiming injuries. The company pointed to the Department's analysis which found that the proposed delay would cost the nation 600 deaths and approximately 4,300 injuries over the lifetime of the 1982-model large cars, and stated that a delay is not justified under any cost/benefit calculations. State Farm also argued that the proposed delay is inconsistent with the overriding mandate of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1381, *et seq.*) and that "the controlling statutes do not permit the Secretary to defer otherwise supportable life-saving regulations solely on the basis of current economic conditions in the auto industry."

State Farm concludes that the current economic situation of the auto industry does not make the implementation of the current automatic restraint schedule impractical. First, nearly all of the necessary capital commitments for automatic restraint implementation for large cars have already been made. Second, the variable costs associated with installing automatic restraints on 1982-model large cars are insignificant to the industry. State Farm also argued that the balance of costs against benefits does not support the proposed delay; rather, it supports an acceleration of the existing schedule if anything. The company cited a recent study by Professor William Nordhaus (discussed below) which contends that the annual economic costs of the proposed deferral of the model year 1982 requirements relative to the current schedule are five times greater than the economic benefits to the auto industry.



It is State Farm's position that as a matter of law and statutory power, the Department cannot rely on the general economic health of the automobile industry to justify a delay in the implementation of the life-saving automatic restraint standard. The comment cites the Senate report concerning the Vehicle Safety Act which stated that safety is "the overriding consideration" in carrying out the purposes of the Act (S. Rep. No. 1301, 89th Cong., 2d Sess. 6 (1966)). State Farm argues that economic considerations in rulemaking by the Department and NHTSA under the Vehicle Safety Act must relate to the costs and benefits of the standard itself and not to the general health of the auto industry: "... if the Secretary were to implement the proposed delay in this rulemaking on the basis of the general employment, production, and economic status of the auto industry, he would be acting arbitrarily and capriciously and outside the scope of his statutory authority." The legal memorandum submitted in support of State Farm's contentions included the following argument:

If the general economic condition of the auto industry could justify suspending implementation of the automatic restraint standard in the face of such cost and benefit data, the industry's economic condition could also be used to justify suspension or elimination of other safety standards. The industry's current problems could thus be used to effectively nullify the National Traffic and Motor Vehicle Safety Act.

Professor William Nordhaus of Yale University submitted comments concerning the economic ramifications of the proposed delay in the first phase of the automatic restraint requirements. (The submission was sponsored by Allstate, Kemper, Nationwide, and State Farm Insurance Companies.) (For a full discussion of the methodology and bases for these calculations, one should refer to the Nordhaus submission filed at the National Highway Traffic Safety Administration under Docket 74-14, Notice 20. NHTSA's response to this analysis is set forth in detail in the Appendix to the Regulatory Impact Analysis.) The basic conclusions contained in the Nordhaus comment are as follows (verbatim):

1. The current passive restraint requirement (FMVSS 208) has very substantial net benefits

compared to current lap and shoulder belt usage. According to the economic analysis presented here, the current rule has net benefits of approximately \$10 billion for model years 1982-85. The substantial economic gain from passive restraints should not be ignored in debates on fine-tuning the phase-in.

2. Using standard analysis, the ranking of options in terms of net benefits is as follows (with the first having the highest net benefits and the last the lowest net benefits):

(1) Simultaneous 1983 implementation (all cars equipped with passive restraints in 1983).

(2) Delay and reversal (small cars in 1983, intermediate cars in 1984, large cars in 1985).

(3) The current rule (large cars in 1982, intermediate cars in 1983, and small cars in 1984).

(4) The proposed delay (large and intermediate cars in 1983, small cars in 1984).

(5) General rollback (large cars in 1983, intermediate cars in 1984, large cars in 1985).

3. A sensitivity analysis shows the ranking of alternatives is unchanged under a wide range of alternative assumptions.

4. Any deferral of requirements to install passive restraints on any size automobile has net costs unless it is "traded in" on an acceleration of requirements on a larger number, or a smaller sized, set of automobiles.

5. In terms of the costs and benefits of different options, there is no justification for either the proposed delay or for a general rollback. In particular, the economic costs of the proposed delay are approximately 5 times greater than the benefits, for a net cost of over \$200 million. The net costs of the general rollback are significantly greater, in the order of \$4.5 billion.

6. There appears to be strong economic justification for the simultaneous 1983 option if it is technically feasible.

7. The analysis indicates that the delay and reversal option has the highest net benefits of any of the four considered in the proposal and regulatory analysis. The superior net benefit of delay and reversal arises because the reversal of the requirement to small cars first affects a larger number of automobiles more quickly and because the net economic benefits per vehicle are greater for small cars than for large and intermediate cars.

8. The estimated impact of the proposed delay on the automobile industry is minuscule. There will be little or no improvement in the "health" of the domestic automobile industry from the proposed delay. For this reason, nonregulatory considerations discussed in the notice (the effect on imports, the conditions of the automobile industry, or freedom-of-choice arguments) should not, from an economic point of view, enter in this rulemaking.

The proposed delay of the automatic restraint requirements was also opposed by various consumer groups and health-related organizations, including: the Consumer Federation of America, the National Spinal Cord Injury Foundation, the Epilepsy Foundation of America, the Consumers Union, the Automotive Occupant Protection Association, the National Safety Council, the Houston Independent School District, the American College of Surgeons, the Georgia Department of Human Resources, the New York Department of Transportation, and the Center for Auto Safety. The National Safety Council conceded that the economic situation of the auto industry is serious, but stated that any adjustment of the implementation schedule for automatic restraints should also include consideration of an earlier implementation for small cars, since the need for protection is much greater in these vehicles.

The Automotive Occupant Protection Association stated that it could support the proposed delay of the automatic restraint requirements for one year, as well as a reversal of the implementation schedule, provided there is a requirement for the major automobile manufacturer to offer optional air bag systems on at least one model line. The association is concerned that further delay of the automatic restraint standard could drive the remaining air bag supplier manufacturers out of the business, and the life-saving potential of air bags could be lost. The Epilepsy Foundation of America echoed this sentiment and stated that "consumers deserve a guarantee that would assure the air bag option will be available in any model they wish to purchase."

The Consumers Union argued that the auto industry's financial condition should not be used to justify "less safe automobiles." Moreover, according to the Union, the proposed delay is unlikely to

significantly alleviate the financial problems facing domestic automobile manufacturers.

The Center for Auto Safety argued that the proposed delay of the first-phase automatic restraint requirements will not help the auto industry solve its current economic problems. In addition, the Center stated that the projected savings of 600 lives and 4,300 injuries associated with the first-phase requirements represents an economic gain of approximately \$170 million, and this far outweighs any savings to the industry. In regard to a possible reversal of the existing implementation schedule for automatic restraints, the Center stated that automatic belts can be installed on all small cars with a leadtime as short as one year because automatic belts are so well developed.

Comments were also received from two manufacturers which supply air bag system components, Thiokol and Rocket Research Company. Rocket Research stated that it could support the proposed delay and reversal of the implementation schedule provided any such change also contains a requirement that the major manufacturers "tool for and offer for sale" air bag systems on at least one car line. The company stated that without such a guarantee there is little incentive for air bag suppliers to remain in the business. Rocket Research stated that an indefinite delay of the automatic restraint requirements over the next five years would amount to a business loss of 23 percent. The company also stated that cost savings accruing to General Motors and Ford because of the one year delay (estimated in the proposal to be approximately 37 million dollars) would be reduced if air bag programs are delayed or eventually canceled since both Rocket Research and Hamill Manufacturing Company have substantial claims against the two companies for capital expenditures to build and equip production plants to make air bag modules. (Rocket Research stated that these claims are based on letters of agreement and contingent liability statements.)

Thiokol stated that the model year 1982 automatic restraint requirements for large cars resulted in the first major production program for Thiokol, and that substantial funds have been expended for manpower, tooling and facilities to meet this requirement. According to Thiokol, a one-year delay in the program would add



substantial additional expenses and result in a reduction of manpower, facility use and vendor capability. In response to questions contained in the notice of proposed rulemaking, Thiokol stated that another year of delay would discourage rather than encourage further design improvements and research efforts in automatic restraint systems.

#### **B. Comments Favoring the Delay**

The Pacific Legal Foundation supported the proposed one-year delay, and stated four primary reasons why such a delay is warranted.

1. The proposed delay would create additional time for the Department of Transportation to implement an adequate evaluation program for air bags.
2. The proposed delay would give the American public an additional year of freedom to choose their means of occupant protection.
3. The proposed delay would allow additional time for the public to familiarize itself with passive restraints [which have been or will be voluntarily installed prior to a mandatory effective date].
4. The proposed delay would reduce the likelihood of costly Congressional action on the passive restraint standard after its implementation.

The proposed delay of the first phase of the automatic restraint requirements was unanimously supported by all commenting automobile manufacturers, both domestic and foreign. Additionally, most manufacturers urged the Department to reconsider the entire standard and to provide additional leadtime for all phases of the implementation schedule or to revoke the automatic restraint requirements altogether. Regarding a possible reversal of the current implementation schedule, nearly all of the foreign automobile manufacturers stated that it would be impossible to install automatic restraints on 1983 model small passenger cars because of insufficient leadtime.

Chrysler Corporation also urged that the automatic restraint requirements be withdrawn entirely. The company argued that automatic belts will be disconnected by many motorists and that purchasers will turn to models that are not equipped with automatic belts. Chrysler predicts

that automatic belts would create a consumer "backlash" greater than that resulting from ignition interlocks (devices installed on 1974-75 models which made it impossible to start the vehicle unless the seatbelt was fastened).

In lieu of automatic restraints, Chrysler urged the Department to mount a national educational effort to increase the use of current manual seat belt systems: "Increased usage of these systems is the most cost effective and immediate method of reducing injuries and fatalities in motor vehicle accidents." Regarding a possible reversal of the current implementation schedule, Chrysler stated that it would be impossible at this time to advance automatic belt installation for small cars prior to the 1984 model year.

American Motors Corporation recommended that a delay in effective date of the automatic restraint requirements be adopted for all cars to permit a re-evaluation of all issues. The company particularly does not support a reversal of the implementation schedule so that small cars would be phased in first, since the company will rely on technology developed for or by other automobile manufacturers after it is proven in actual volume production. American Motors also recommended that if a new phase-in schedule is adopted, at least a one-year delay for low-volume manufacturers (e.g., less than 200,000 sales) be included in the change.

Foreign vehicle manufacturers produce few, if any, large passenger cars (i.e., cars with wheelbases over 114 inches), but all the foreign manufacturers supported the proposed delay of the first phase of the automatic restraint requirements. However, these manufacturers were unanimously against any reversal of the existing implementation schedule that would require small passenger cars to be equipped with automatic restraints a year earlier than currently required.

Fiat Motors of North America recommended that the entire automatic restraint schedule be delayed for one year (i.e., each phase delayed one year). The company stated that if its small cars were not required to comply until model year 1985, it would give the company more time to develop appropriate automatic belt designs for its convertibles. Fiat stated that it is currently having difficulty with its convertibles in terms of finding adequate automatic belt attachments and



fittings for existing vehicle structures. Fiat stated that it would prefer to see the automatic restraint standard revoked and mandatory seat belt use laws implemented.

Nissan Motor Company stated that it would not be possible to equip its small cars with automatic restraints by September 1, 1982. Nissan's objection does not relate to capital expenditure or retail price increase, but rather, to "the lack of proper leadtime needed to develop acceptable, reliable and high quality vehicles for the consumer." Nissan argued that automatic belts already face a tough challenge in winning consumer acceptance without forcing the imposition of hastily developed designs.

Toyota Motor Company also stated that it could not comply with a change in the effective date for small cars from September 1, 1983, to September 1, 1982. Toyota stated that if such a change is adopted, it would have to drop from production certain of its volume passenger car lines for the 1983 model year, thereby limiting the freedom of choice of the customers who wish to purchase Toyota cars.

Volvo of America Corporation requested that the implementation schedule for automatic restraints be amended to reflect the fact that the current market situation has forced the industry to be flexible with respect to model year introductions. Volvo refers specifically to the desire of some manufacturers to continue model lines past the September 1 effective dates for the three phases of the current implementation schedule, and to discontinue these lines at the beginning of the new calendar year. Volvo argues that tooling for installation of automatic restraints on model lines that will be discontinued six months after the effective date of the standard is cost prohibitive. Consequently, without a change in the implementation schedule, manufacturers would be required to cease production of certain models sooner than they would like.

Volvo recommends that the implementation schedule be amended to provide that the effective

dates for the three phases is "September 1 or the date of production start of the new model year if this date falls between September 1 and December 31."

Rolls-Royce Motors produces three models that would have to be equipped with automatic restraints by September 1, 1981, under the existing schedule. Rolls-Royce originally planned to offer air bags in these models but changed plans after General Motors announced in 1979 that it would delay the introduction of air bags. Consequently, Rolls-Royce states that it got a late start with automatic belts and the automatic belt system it has planned for the 1982 models is not developed to a degree of refinement normally associated with Rolls-Royce cars. In support of the proposed one-year delay in the automatic restraint requirements, Rolls-Royce made the following comment:

Refinement, weight and cost will all be subject to continuous development anyway but one year extra leadtime would permit full development of the system before the customer is charged a cost premium for the restraint system.

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(NOTE: Allstate Insurance Company requested that a public hearing be held on the one-year delay in the large car requirement. However, due to the limited time available before the previous effective date of this requirement, the agency must deny this request. The issues on which this decision is based are primarily technical and economic, lending themselves well to written presentations. Interested parties have taken full advantage of the opportunity to provide their views in writing in this proceeding. Further, an additional opportunity for comment on issues relating to the automatic restraint standard is provided in the notice of proposed rulemaking issued today.)

**PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD  
NO. 208**

**Occupant Crash Protection  
(Docket No. 74-14; Notice 25)**

**ACTION:** Final rule.

**SUMMARY:** The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, to rescind the requirements for installation of automatic restraints in the front seating positions of passenger cars. Those requirements were scheduled to become effective for large and mid-size cars on September 1, 1982, and for small cars on September 1, 1983.

The automatic restraint requirements are being rescinded because of uncertainty about the public acceptability and probable usage rate of the type of automatic restraint which the car manufacturers planned to make available to most new car buyers. This uncertainty and the relatively substantial cost of automatic restraints preclude the agency from determining that the standard is at this time reasonable and practicable. The reasonableness of the automatic restraint requirements is further called into question by the fact that all new car buyers would be required to pay for automatic belt systems that may induce only a few additional people to take advantage of the benefits of occupant restraints.

The agency is also seriously concerned about the possibility that adverse public reaction to the cost and presence of automatic restraints could have a significant adverse effect on present and future public acceptance of highway safety efforts.

Under the amended standard, car manufacturers will continue to have the current option of providing either automatic or manual occupant restraints.

**DATES:** The rescission of the automatic restraint requirements of Standard No. 208 is effective December 8, 1981. Any petitions for reconsideration must be received by the agency not later than December 3, 1981.

**ADDRESS:** Any petitions for reconsideration should refer to the docket number and notice number of this notice and be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:** Mr. Michael Finkelstein, Associate Administrator for Rulemaking, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-1810)

**SUPPLEMENTARY INFORMATION:** On April 9, 1981, the Department of Transportation published a notice of proposed rulemaking (NPRM) setting forth alternative amendments to the automatic restraint requirements of Standard No. 208 (46 F.R. 21205). The purpose of proposing the alternatives was to ensure that Standard No. 208 reflects the changes in circumstances since the automatic restraint requirements were issued (42 F.R. 34289; July 5, 1977) and to ensure that the standard meets the requirements of the National Traffic and Motor Vehicle Safety Act of 1966 and Executive Order 12291, "Federal Regulations" (February 17, 1981).

**Background and NPRM**

The automatic restraint requirements were adopted in 1977 in response to the high number of passenger car occupants killed annually in crashes and to the persistent low usage rate of manual belts. The manual belt is the type of belt which is found in most cars today and which the occupant must place around himself or herself and buckle in order to gain its protection. Then, as now, there were two types of automatic restraints, i.e., restraints that require no action by vehicle occupants, such as buckling a belt, in order to be ef-



fective. One type is the air cushion restraint (air bag) and the other is the automatic belt (a belt which automatically envelopes an occupant when the occupant enters a vehicle and closes the door).

In view of the greater experience with air bags in large cars and to spread out capital investments, the Department established a large-to-small car compliance schedule. Under that schedule, large cars were required to begin compliance on September 1, 1981, mid-size cars on September 1, 1982, and small cars on September 1, 1983.

On April 6, 1981, after providing notice and opportunity for comment, the Department delayed the compliance date for large cars from September 1, 1981, to September 1, 1982. As explained in the April 6, final rule, that delay was adopted

. . . because of the effects of implementation in model year 1982 on large car manufacturers, because of the added significance which those effects assume due to the change in economic circumstances since the schedule was adopted in 1977, and because of the undermining by subsequent events of the rationale underlying the original phase-in schedule.

Simultaneous with publishing the one-year delay in the effective date for large cars, the Department also issued a proposal for making further changes in the automatic restraint requirements. This action was taken in response to a variety of factors that raised questions whether the automatic restraint requirements represented the most reasonable and effective approach to the problem of the low usage of safety belts. Among these factors were the uncertainty about public acceptability of automatic restraints in view of the absence of any significant choice between automatic belts and air bags and the nature of the automatic belt designs planned by the car manufacturers, the consequent uncertainties about the rate of usage of automatic restraints, and the substantial costs of air bags even if produced in large volumes.

The three principal proposals were reversal of phase-in sequence, simultaneous compliance, and rescission. The reversal proposal would have changed the large-to-small car order of compliance to a requirement that small cars commence compliance on September 1, 1982, mid-size cars on September 1, 1983, and large cars on September 1, 1984. The proposal for simultaneous compliance would have required all size classes to begin compliance on the same date, March 1, 1983. The rescission proposal would have retained the manufacturers' current option of equipping their cars with either manual or automatic restraints.

In addition, the Department proposed that, under both the first and second alternatives, the automatic restraint requirements be amended so that such restraints would not be required in the front center seating position.

Following the close of the period for written comments on the April NPRM, NHTSA decided, at its discretion, to hold a public meeting on the alternatives. The purpose of the meeting was to permit interested parties to present their views and arguments orally before the Administrator and ensure that all available data were submitted to the agency. The notice announcing the meeting indicated that participants at the hearing would be permitted to supplement their previous comments. The notice also urged participants to consider the issues raised in former Secretary Coleman's June 14, 1976 proposal regarding occupant restraints and in former Secretary Adams' March 24, 1977 proposal regarding automatic restraints.

### **Rationale for Agency Decision**

The decision to rescind the automatic restraint requirements was difficult for the agency to make. NHTSA has long pursued the goal of achieving substantial increases in the usage of safety belts and other types of occupant restraints. Former Secretary Adams clearly believed that he had ensured the achievement of that goal in July 1977 when he promulgated the automatic restraint requirements. Now that goal appears as elusive as ever. Instead of being equipped with automatic restraints that will protect substantially greater numbers of persons than current manual belts, most new cars would have had a type of automatic belt that might not have been any more acceptable to the public than manual belts. The usage of those automatic belts might, therefore, have been only slightly higher than that of manual belts. While most of the anticipated benefits have virtually disappeared, the costs have not. Vehicle price increases would have amounted to approximately \$1 billion per year.

This turn of events may in part reflect the failure of the Department in the years following 1977 to conduct a long term effort to educate the public about the various types of restraints and the need to use them. The need for such an undertaking was seen by former Secretary Coleman in announcing his decision in 1976 to conduct an automatic restraint demonstration project prior to deciding



whether to mandate automatic restraints. His instruction that NHTSA undertake significant new steps to promote safety belt usage was never effectively carried out. The result of such an effort could have been that a substantial portion of the public would have been receptive to a variety of automatic restraint designs. As a result of concern over public acceptance, manufacturers have designed their automatic restraints to avoid creating a significant adverse reaction. Unfortunately, the elements of design intended to minimize adverse reaction would also minimize the previously anticipated increases in belt usage and safety benefits of requiring new cars to have automatic restraints instead of manual belts.

The uncertainty regarding the usage of the predominant type of planned automatic restraint has profound implications for the determinations which NHTSA must make regarding a standard under the National Traffic and Motor Vehicle Safety Act. NHTSA has a duty under the Vehicle Safety Act and E.O. 12291 to review the automatic restraint requirements in light of changing events and to ensure that the requirements continue to meet the criteria which each Federal Motor Vehicle Safety Standard must satisfy. If the criteria cannot be satisfied, the agency must make whatever changes in the standard are warranted. The agency must also have the flexibility to modify its standards and programs in its efforts to find effective methods for accomplishing its safety mission.

The agency believes that the post-1977 events have rendered it incapable of finding now, as it was able to do in 1977, that the automatic restraint requirements would meet all of the applicable criteria in the Vehicle Safety Act. Section 103(a) of the Vehicle Safety Act requires that each Federal Motor Vehicle Safety Standard meet the need for safety and be practicable and objective. Each standard must also be reasonable, practicable and appropriate for each type of vehicle or equipment to which it applies (Section 103(f) (3)). To meet the need for safety, a standard must be reasonably likely to reduce deaths and injuries. To be found practicable, the agency must conclude that the public will in fact avail themselves of the safety devices installed pursuant to the standard. (*Pacific Legal Foundation v. Department of Transportation*, 593 F. 2d 1338, at 1345-6 (D.C. Cir. 1979)). To be reasonable and practicable, a standard must be economically and technologically feasible, and

the costs of implementation must be reasonable. (S. Rep. No. 1301, 89th Cong., 2d Sess. 6 (1966).)

In reaching the decision announced by this notice, NHTSA has reviewed the enormous record compiled by this agency over the past decade on automatic restraints. Particular attention was paid to the information and issues relating to the notices which the Agency or Department has issued regarding automatic restraints since 1976. All comments submitted in response to the April 1981 proposal by proponents and opponents of the automatic restraint requirements have been thoroughly considered. A summary of the major comments is included as an appendix to this notice. The agency's analysis of those comments may be found in this notice and the final regulatory impact analysis. A copy of the analysis has been placed in the public docket.

*Usage of automatic restraints and safety benefits.* As in the case of the comments submitted concerning the one-year delay in automatic restraint requirements for large cars, the commenters on the April 1981 proposal expressed sharply divergent views and arguments and reached widely differing conclusions concerning the likely usage rates and benefits of the automatic restraints planned for installation in response to the automatic restraint requirements. The wide distance between the positions of the proponents and opponents of these requirements stems primarily from the lack of any directly relevant data on the most important issue, i.e., the public reaction to and usage rate of detachable automatic belts. These disagreements once again demonstrate the difficulty in reaching reliable conclusions due to the uncertainty created by the lack of adequate data.

In issuing the automatic restraint requirements in 1977, NHTSA assumed that the implementation of those requirements would produce substantial benefits. According to the analysis which NHTSA performed in that year, automatic restraints were expected to prevent 9,000 deaths and 65,000 serious injuries once all cars on the road were equipped with those devices. That prediction was premised on several critical assumptions. Most important among the assumptions were those concerning the safety benefits of automatic restraints—reductions in death and injury—which in turn are a function of the types of automatic restraints to be placed in each year's production of new cars.

The agency assumed that the combination of air bags and lap belts would be approximately 66 percent effective in preventing fatalities and that automatic belts would have a 50 percent level of effectiveness. The agency assumed also that air bags would be placed in more than 60 percent of new cars and that automatic belts would be placed in the remaining approximately 40 percent. The agency's analysis predicted that air bags would provide protection in virtually all crashes of sufficient severity to cause deployment of the air bags. It was further assumed that the automatic belts would be used by 60 to 70 percent of the occupants of those cars.

As to public reaction, the agency anticipated that the public would, as a whole, accept automatic restraints because it could choose between the two types of those restraints. Those not wanting automatic belts would select an air bag. Partly as a function of the expected large volume of air bag installation, the agency projected that the cost of air bags would be only slightly more than \$100 (in 1977 dollars) more than manual belts.

As part of its efforts to monitor and facilitate implementation of the automatic restraint requirements, the agency continued its gathering of data about the use and effectiveness of air bags and of automatic belts with use-inducing features, the only type of automatic belt available to the public. With respect to automatic belts, this effort was carried out through a contract with Opinion Research Corporation. Under that contract, observations were made of seat belt usage during the two year period beginning November 1977. These observations provided data on usage of manual and automatic belts in model year 1975-79 VW Rabbits and of manual belts in model year 1978-79 GM Chevettes. As a result of voluntary decisions by VW and GM, a number of the Rabbits and Chevettes were equipped with automatic belts. The observation data showed usage rates of about 36 percent for manual belts and about 81 percent for automatic belts in the Rabbits. The observed rate of manual belt usage in Chevettes was 11 percent. There were insufficient numbers of model year 1978-79 Chevettes equipped with automatic belts to develop reliable usage figures.

Several telephone surveys were also made under contract with Opinion Research. The first survey involved owners of model year 1979 VW Rabbits and GM Chevettes equipped with automatic belts and

was conducted during 1979. This survey showed that 89 percent of Rabbit owners and 72 percent of Chevette owners said that they used their automatic belts. A second survey was conducted in late 1979 and early 1980. It covered owners of model year 1980 Rabbits and Chevettes. The usage rates found by the second survey were almost identical to those in the first survey.

Now, however, the validity of the benefit predictions in 1977 and the relevancy of the extensive data gathered by NHTSA on air bags and on automatic belts with use-inducing features have been substantially if not wholly undermined by drastic changes in the types of automatic restraints that would have been installed under the automatic restraint requirements. Instead of installing air bags in approximately 60 percent of new cars, the manufacturers apparently planned to install them in less than 1 percent of new cars. Thus, automatic belts would have been the predominant means of compliance, and installed in approximately 99 percent of new cars. Thus, the assumed life-saving potential of air bags would not have been realized.

Manufacturers have stated that they chose belt systems for compliance because of the competitive disadvantage of offering the relatively expensive, inadequately understood air bag when other manufacturers would have been providing automatic belts. These explanations seem credible.

The other drastic change concerns the type of automatic belt to be installed. Although some aspects of the car manufacturers' automatic belt plans are still tentative, it now appears reasonably certain that if the automatic restraint requirements were implemented, the overwhelming majority of new cars would be equipped with automatic belts that are detachable, unlike the automatic belts in Rabbits and Chevettes. Most planned automatic belts would be like today's manual lap and shoulder belts in that they can be easily detached and left that way permanently.

Again, this design choice would appear to have arisen out of concern that without such features emergency exit could be inhibited, and, in part as a result of a perception of this fact, public refusal to accept new designs would be widespread. The agency shares this concern, and has since 1977 required that all such belts provide for emergency exit. Agency concerns on this point have been



validated by recent related attitudinal research, discussed below.

In its final rule delaying the initial effective date of the automatic restraint requirements, the April 1981 proposal and the associated documents analyzing the impacts of those actions, NHTSA expressly confronted the lack of usage data directly relevant to the type of automatic belts now planned to be installed in most new cars. The agency stated that there were several reasons why the available data was of limited utility in attempting to make any reliable predictions about the usage of easily detachable automatic belts. The most important reason, which has already been noted, is that the predominant type of planned automatic belt would not have had features to ensure that these belts are not detached.

Second, all of the available data relate to only two subcompacts, the Rabbit and the Chevette. Due to a combination of owner demographics and a correlation between driver perception of risk and the size of the car being driven, belt usage rates are typically higher in small cars than in larger ones. Therefore, the usage rates for the two subcompacts cannot simply be adopted as the usage rates for automatic belts in all car size classes.

Third, most of the Rabbit and Chevette owners knew that their new car would come with an automatic belt and had it demonstrated for them, even if many state that they did not consciously choose that type of belt. Having voluntarily invested in automatic restraints, they are more likely to use those restraints than someone who is compelled to buy them.

The significance of the fundamental difference between the nondetachable and detachable automatic belt bears further discussion. The Rabbit automatic belts are, as a practical matter, not permanently detachable since they are equipped with an ignition interlock. If the belt is disconnected, the interlock prevents the starting of the car. Each successive use would therefore require reconnection before engine start. The Chevette automatic belts also were initially equipped with an ignition interlock. Beginning in model year 1980, the Chevette belts were made both practically and literally nondetachable. They consist of a continuous, nondetachable shoulder belt. Additional webbing can be played out to produce slack in the belt; however, the belt remains attached at both ends.

By contrast, the automatic belts now planned for most cars do not have any effect on the starting of the cars and are easily detachable. Some belt designs may be detached and permanently stowed as readily as the current manual lap and shoulder belts. Once a detachable automatic belt is detached, it becomes identical to a manual belt. Contrary to assertions of some supporters of the standard, its use thereafter requires the same type of affirmative action that is the stumbling block to obtaining high usage levels of manual belts. If the car owners perceive the belts as simply a different configuration of the current manual belts, this stumbling block is likely to remain. They may treat the belt as a manual one and thus never develop the habit of simply leaving the belt attached so that it can act as an automatic belt.

The agency recognizes the possibility that the exposure of some new car purchasers to attached automatic belts may convert some previously occasional users of manual belts to full time belt users. Present attitudinal survey data clearly establish the existence of a population of such occupants who could be influenced by some external factor to convert to relatively constant users. However, the agency believes that many purchasers of new cars having detachable automatic belts would not experience the potential use-inducing character of attached automatic belts unless they had taken the initiative themselves to attach the belts.

Thus, the change in car manufacturers' plans has left the agency without any factual basis for reliably predicting the likely usage increases due to detachable automatic belts, or for even predicting the likelihood of any increase at all. The only tentative conclusion that can be drawn from available data is that the installation of *nondetachable* automatic belts in other subcompacts could result in usage rates near those found in Rabbits and Chevettes. Even that use of the Rabbit and Chevette data may be questionable, however, given the element of voluntarism in the purchase of automatic belts by many of the Rabbit and Chevette owners. Thus, the data on automatic belt use in Rabbits and Chevettes may do little more than confirm the lesson of the model year 1974-75 cars equipped with manual belts and ignition interlocks, i.e., that the addition to a belt system of a feature that makes the belt nondetachable or necessitates its attachment before a car can be started can substantially increase the rate of belt usage.



In estimating automatic belt usage rates for the purposes of the April final rule and proposal, the agency recognized the substantial uncertainty regarding the effects of easily detachable automatic belts on belt usage. NHTSA attempted to compensate for the lack of directly relevant data by using two different techniques to predict a potential range of usage.

One technique was to assume a consistent multiplier effect, whereby belt usage in cars of all size classes would be assumed to be more than slightly double as it had in Rabbits. A doubling of the current 10–11 percent manual belt usage rate projected over the general car fleet would mean a 22 percent rate could be achieved with the installation of automatic belts. The other technique was to assume that there would be a consistent additive effect, whereby the same absolute percentage point increase in belt usage would occur as there had been in the case with Rabbits. Use of this method would result in a predicted 50 percentage point increase in belt usage, over the entire fleet, from the current 10–11 percent to approximately 60 percent.

The agency used the results of these two techniques in an attempt to construct a range of possible increases in belt usage. Thus, a range of 15 to 60 percent was used in both the final regulatory impact analysis for the April rulemaking to defer the effective date for one year and the preliminary analysis for the current action. The figure of 15 percent was derived by doubling the observed 7 percent usage levels in the large type cars affected by the deferral. A figure of 22 percent would have been more appropriate as the low end of the range for the current action, since it would represent a doubling of the current usage rate of the car fleet as a whole. This latter figure has been used in addressing this question in the current final regulatory analysis.

Although the agency had no definitive way of resolving the uncertainty about the usage of detachable automatic belts, the agency estimated that belt usage with automatic belts would most likely fall near the lower end of either range. This estimate was based on a variety of factors. Most relate to the previously discussed limitations in the relevancy of the observations and surveys of Rabbit and Chevette owners. In addition, those data were on their face inconsistent with data regarding automatic belt usage in crashes involving Rab-

bits. Those crash data indicated a usage rate of 55–57 percent instead of the better than 80 percent rate indicated by the observation study and telephone surveys.

Thus, the agency made the preliminary judgment in its impact analyses that the switch from manual belts to detachable automatic belts could approximately double belt usage. However, the April 1981 final rule noted that the actual belt usage might be lower, even substantially so. With respect to cars with current low usage rates, that notice stated that the usage rate of detachable automatic belts might only approach levels similar to those currently achieved with manual belts.

The commenters on the April 1981 NPRM did not present any new factual data that could have reduced the substantial uncertainty confronting the agency. Instead, the commenters relied on the same data examined by the agency in its impact analyses.

The commenters were sharply divided on the question of usage rates. Proponents of the automatic restraint requirements did not in their analyses address the significance of the use-inducing nature of the nondetachable automatic belts in the Rabbits and Chevettes or the demographic factors relating to those car purchasers. Instead, they asserted that the usage rates achieved in Rabbits and Chevettes would, with slight adjustments, also be achieved in other car size classes. In reaching this conclusion, they asserted that the usage rate increases of automatic belts shown by Rabbit and Chevette owners were the same regardless of whether the automatic belts were purchased knowingly or unknowingly. There was an exception to this pattern of comment among the proponents. One public spokesperson for an interest group acknowledged that automatic belts could be designed in a way that they so closely resembled manual belts that their usage rates would be the same.

Opponents of the automatic restraint requirements, relying on the similarity of detachable automatic belts to manual belts, predicted that the automatic belts would not have any substantial effect on belt usage. The opponents of the requirements also dismissed the experience of the Rabbit and Chevette owners on the grounds that the automatic belts in those cars had been voluntarily purchased and were nondetachable.

While the public comments did not provide the agency with any different or more certain basis for estimating belt usage than it already had, they did induce the agency to reexamine its assumption about the possible automatic belt usage rates. Although it is nearly impossible to sort out with precision the individual contributions made by nondetachability, interlocks, car size, demographics and other factors, NHTSA believes that the usage of automatic belts in Rabbits and Chevettes would have been substantially lower if the automatic belts in those cars were not equipped with a use-inducing device inhibiting detachment.

In the agency's judgment, there is a reasonable basis for believing that most of the increase in automatic belt Rabbits and Chevettes is due to the nondetachability feature, whether an interlock or other design feature, of their belt systems. Necessitating the attachment of belts by the addition of interlocks to 1974-75 cars resulted in an increase in manual belt usage by as much as 40 percent in cars subject to that requirement. A similar effect in the case of the Rabbit would account for four-fifths of the increase observed in the automatic belt vehicles. A significant portion of the remaining increase could in fact be attributable to the fact many owners of automatic belt Rabbits and Chevettes knowingly and voluntarily bought the automatic belts. By the principle of self-selection, these people would be more inclined to use their belts than the purchasers of 1974-75 Rabbits who did not have any choice regarding the purchase of a manual belt equipped with an interlock. This factor would not, of course, be present in the fleet subject to the standard.

The most appropriate way of accounting for the detachability problem and other limitations on the validity of that Rabbit and Chevette data would be to recognize that the levels of usage resulting from both the point estimates are based on uncertain conclusion and adjust each appropriately. The agency's estimate in the final regulatory impact analysis for the April 1981 final rule that usage would likely fall near the lower end of the range had the effect of substantially adjusting downward the usage rate (60 percent) produced by the technique relying on the absolute percentage point increase (50 percentage points) in belt usage in automatic belt Rabbits and Chevettes. A similar adjustment could also be made in the usage rate (15 percent) indicated by the multiplier technique.

Throughout these sequential analyses, the agency has examined the extremely sparse factual data, applied those factors which are known to externally affect usage rates, and defined for analytical purposes the magnitude of potential safety effects. Aside from the initial data points, all such analyses in all cases necessarily involve exercises of discretion and informed judgment. Resultant conclusions are indications of probable usage which always have been and always must be relied upon by the agency in the absence of additional objective data.

The agency believes that the results produced by both techniques must be adjusted to account for the effects of detachability and the other factors affecting usage rates. Therefore, as the April 1981 final rule recognized, the incremental usage attributable to the automatic aspect of the subject belts may be substantially less than 11 percent.

The agency's analysis of the public comments and other available information leads it to conclude that it cannot reliably predict even a 5 percentage point increase as the minimum level of expected usage increase. The adoption of a few percentage points increase as the minimum would, in the agency's judgment, be more consistent with the substantial uncertainty about the usage rate of detachable automatic belts. Based on the data available to it, NHTSA is unable to assess the probability that the actual incremental usage would fall nearer a 0 percentage point increase or nearer some higher value like a 5 or 10 percentage point increase.

Thus, the agency concludes that the data on automatic belt usage in Rabbits and Chevettes does not provide a sufficient basis for reliably extrapolating the likely range of usage of detachable automatic belts by the general motoring public in all car size classes. Those data are not even sufficient for demonstrating the likelihood that those belts would be used in perceptibly greater numbers than the current manual belts. If the percentage increase is zero or extremely small due to the substantial similarity of the design and methods of using detachable automatic belts and manual belts, then the data regarding manual belt usage would be as reliable a guide to the effects of detachable automatic belts on belt usage as data regarding usage of nondetachable automatic belts. Indeed, the manual belt data may even be a more reliable guide since the data are based on usage by the



general motoring public in cars from all size and demographic classes.

In view of the uncertainty about the incremental safety benefits of detachable automatic belts, it is difficult for the agency to determine that the automatic restraint requirements in their present form meet the need for safety.

In concluding that for this reason detachable automatic belts may contribute little to achieving higher belt usage rates, the question then arises whether the agency should amend the standard to require that automatic belts have a use-inducing feature like that of the Rabbit and Chevette automatic belts. NHTSA believes that such features would increase belt usage. The agency does not, however, believe that such devices should be mandated, for the reasons discussed in detail below.

*Costs of automatic restraints.* In view of the possibly minimal safety benefits and substantial costs of implementing the automatic restraint requirements, the agency is unable to conclude that the incremental costs of the requirements are reasonable. The requirements are, in that respect, impracticable. While the car manufacturers have already made some of the capital expenditures necessary to comply with the automatic restraint requirements, they still face substantial, recurring variable costs. The average price increase per car is estimated to be \$89. The costs of air bags and some designs of automatic belts would be substantially higher. With a total annual production of more than 10 million cars for sale in this country, there would be a price effect of approximately \$1 billion.

While the car manufacturers might be able to pass along some or all of their costs to consumers, the necessary price increases would reduce sales. There might not be any net revenue loss since the extra revenue from the higher prices could offset the revenue loss from the lower volume of sales. However, those sale losses would cause net employment losses. Additional sales losses might occur due to consumer uncertainty about or antipathy toward the detachable automatic belts which do not stow so unobtrusively as current manual lap and shoulder belts.

Consumers would probably not be able to recoup their loss of disposable income due to the higher car prices. There does not appear to be any certainty that owners of cars with detachable automatic belts

would receive offsetting discounts in insurance costs. Testimony and written comments submitted to the agency indicate premium reductions generally are available only to owners of cars equipped with air bags, not automatic belts. Some large insurance companies do not now offer discounts to any automatic restraint-equipped cars, even those with air bags. If insurance cost discounts were to be given owners of cars having detachable automatic belts, such discounts would be given only after the automatic belts had produced significant increases in belt usage, and in turn significant decreases in deaths and serious injuries. The apparent improbability of any economic effect approaching the magnitude of the consumer cost means that the discounts would not likely materialize on a general basis.

Insurance company statements at the August 1981 public meeting reaffirmed this belief as they state that they could not now assure reductions in insurance premiums but would have to first collect a considerable amount of claim data.

Finally, the weight added to cars by the installation of automatic belts would cause either increased fuel costs for consumers or further new car price increases to cover the incorporation of offsetting fuel economy improvements.

The agency does not believe that it would be reasonable to require car manufacturers or consumers to bear such substantial costs without more adequate assurance that they will produce benefits. Given the plans of the car manufacturers to rely primarily on detachable automatic belts and the absence of relevant data to resolve the usage question, implementation of the automatic restraint requirements amounts to an expensive federal regulatory risk. The result if the detachable automatic belts fail to achieve significant increases in belt usage could be a substantial waste of resources.

The agency believes that the costs are particularly unreasonable in view of the likelihood that other alternatives available to the agency, the states and the private sector could accomplish the goal of the automatic restraint requirements at greatly reduced cost. Like those requirements, the agency's planned educational campaign is addressed primarily to the substantial portion of the motoring public who are currently occasional users of manual belts.

*Effect on public attitude toward safety.* Although the issue of public acceptance of automatic



restraints has already been discussed as it relates to the usage rate of detachable automatic restraints, there remains the question of the effect of automatic restraints on the public attitude toward safety regulation in general. Whether or not there would be more than minimal safety benefits, implementation of the automatic restraint requirements might cause significant long run harm to the safety program.

No regulatory policy is of lasting value if it ultimately proves unacceptable to the public. Public acceptability is at issue in any vehicle safety rulemaking proceeding in which the required safety equipment would be obtrusive, relatively expensive and beneficial only to the extent that significant portions of the motoring public will cooperate and use it. Automatic belt requirements exhibit all of those characteristics. The agency has given the need for public acceptability of automatic restraints substantial weight since it will clearly determine not only the level of safety benefits but also the general public attitude toward related safety initiatives by the government or the private sector.

As noted above, detachable automatic belts may not be any more acceptable to the public than manual belts at any given point in time. If the detachable automatic belts do not produce more than negligible safety benefits, then regardless of the benefits attributable to the small number of other types of automatic restraints planned to be installed, the public may resent being required to pay substantially more for the automatic systems. Many if not most consumers could well conclude that the automatic belts would in fact provide them with no different freedom of choice about usage or levels of protection than manual belts currently offer. As a result, it is not unreasonable to conclude that the public may regard the automatic restraint requirements as an expensive example of ineffective regulation.

Thus, whether or not the detachable automatic belts might have been successful in achieving higher belt usage rates, mandates requiring such belts could well adversely affect public attitude toward the automatic restraint requirements in particular and safety measures in general. As noted in more detail in the 1976 Decision of Secretary Coleman:

Rejection by the public would lead to administrative or Congressional reversal of a passive restraint requirement that could result in hundreds of millions of dollars of wasted

resources, severe damage to the nation's economy, and, equally important, a poisoning of popular sentiment toward efforts to improve occupant restraint systems in the future.

It can only be concluded that the public attitude described by the Secretary at that time is at least as prevalent today. The public might ultimately have sought the legislative rescission of the requirements. Action-forcing safety measures have twice before been overturned by Congress. In the mid-1970's, Congress rescinded the ignition interlock provision and provided that agency could not require the States to adopt and enforce motorcycle helmet use laws. Some people might also have cut the automatic belts out of their cars, thus depriving subsequent owners of the cars of the protection of any occupant restraint system. These are serious concerns for an agency charged by statute with taking steps appropriate for addressing safety problems that arise not only in the short term but also the long term. The agency must be able to react effectively to the expected increases in vehicle deaths and injuries during the 1980's.

*Equity.* Another relevant factor affecting the reasonableness of the automatic restraint requirements and of their costs is the equity of the distribution of such costs among the affected consumers. Responsible regulatory policy should generally strive to ensure that the beneficiaries of regulation bear the principal costs of that regulation. The higher the costs of a given regulation, the more serious the potential equity problem. The automatic restraint requirements of the standard would have required the current regular user of manual belts not only to pay himself for a system that affords him no additional safety protection, but in part to subsidize the current nonuser of belts who may or may not be induced by the automatic restraints to commence regular restraint usage.

*Option of Adopting Use-Compelling Features.* As noted above, some commenters have suggested that the only safety belts which are truly "passive" are those with use-compelling features. Such commenters have recommended that the agency amend the standard so as to require such features. For example, an ignition interlock which prohibits the car from starting unless the belt is secured is a use-compelling feature. Another example is a passive belt design which is simply not detachable, because no buckle and latch release mechanism is provided. While NHTSA agrees that such use-compelling features could significantly increase

usage of passive belts, NHTSA cannot agree that use-compelling features could be required consistent with the interests of safety. In the case of the ignition interlock, NHTSA clearly has no authority to require such a use-compelling feature. The history of the Congressional action which removed this authority from NHTSA suggests that Congress would look with some disfavor upon any similar attempt to impose a use-compelling feature on a belt system.

But, even if NHTSA were to require that passive belts contain use-compelling features, the agency believes that the requirement could be counter-productive. Recent attitudinal research conducted by NHTSA confirms a widespread, latent and irrational fear in many members of the public that they could be trapped by the seat belt after a crash. Such apprehension may well be contributing factors in decisions by many people not to wear a seat belt at all. This apprehension is clearly a question which can be addressed through education, but pending its substantial reduction, it would be highly inappropriate to impose a technology which by its very nature could heighten or trigger that concern.

In addition, the agency believes there are compelling safety reasons why it should not mandate use-compelling features on passive belts. In the event of accident, occupants wearing belts suffer significantly reduced risk of loss of consciousness, and are commonly able to extricate themselves with relative ease. However, the agency would be unable to find the cause of safety served by imposing any requirement which would further complicate the extrication of any occupant from his or her car, as some use-compelling features would. NHTSA's regulations properly recognize the need for all safety belts to have some kind of release mechanism, either a buckle and latch mechanism or a spool-out release which feeds a length of belt long enough to extricate a car occupant.

*Alternative methods of increasing restraint usage.* Finally, the agency believes that it is possible to induce increased belt usage, and enhance public understanding and awareness of belt mechanisms in general, by means that are at least as effective but much less costly than the installation of millions of detachable automatic belts.

In the decision noted above, Secretary Coleman noted the obligation of the Department of Transportation to undertake efforts to encourage

the public to use occupant restraints, active or passive. Toward this point, Secretary Coleman directed the Administrator of NHTSA to undertake significant new steps to promote seat belt usage during the demonstration program. This instruction of the Secretary was not effectively carried out and, unfortunately, we do not enjoy today the benefits of a prolonged Departmental campaign to encourage seat belt usage. Had such a program been successfully carried out, increased seat belt usage could have saved many lives each year, beginning in 1977.

Rather than allowing the Coleman demonstration program and its accompanying education effort to come to fruition, the Department reconsidered Secretary Coleman's 1976 decision during 1977. At the conclusion of the reconsideration period, the Department reversed that decision, and amended the standard to require the provision of automatic restraints in new passenger cars, in accordance with a phased-in schedule.

The benefits of any such belt use enhancement efforts could have already substantially exceeded those projected for the automatic restraint requirements of this standard. Over the next ten years, the requirements of the standard would have addressed primarily those occasional belt users amenable to change who buy new cars during the mid and late 1980's.

Prior to the initiation of rulemaking in February of this year, the Department had resolved to undertake a major educational effort to enhance voluntary belt usage levels. Such efforts will be closely coordinated with new and preexisting major initiatives at the State level and in the private sector, many of which were discussed at the public meeting on the present rulemaking. These efforts will address not only those users/purchasers amenable to change, but also those currently driving and riding in cars, multipurpose passenger vehicles and trucks on the road today. The potential for immediate impact is thus many times greater. Further, with the much greater number of persons directly impacted, educational efforts would need to raise safety belt usage in the vehicles on the road during the 1980's by only a few percentage points to achieve far greater safety benefits than the automatic restraint requirements could have achieved during the same time period.

This is in no sense to argue or suggest that nonregulatory alternatives are or should be con-



sidered in all cases appropriate to limit Federal regulation. However, the existence of such efforts, and their relevance to calculations of benefits in the present case, must be and has been considered to the extent discussed herein.

### Summary of Agency Conclusion

As originally conceived, the automatic restraint requirement was a far reaching technology forcing regulation that could have resulted in a substantial reduction in injuries and loss of life on our highways.

As it would be implemented in the mid-1980's, however, the requirement has turned into a billion dollar Federal effort whose main technological advance would be to require seat belts that are anchored to the vehicle door rather than the vehicle body, permitting these belts to be used either as conventional active belts or as automatic belts.

To gain this advantage, under the standard as drafted, consumers would see the end of the six passenger car and an average vehicle price increase on the order of \$89 per car. The almost certain benefits that had been anticipated as a result of the use of air bag technology have been replaced by the gravely uncertain benefit estimates associated with belt systems that differ little from existing manual belts.

In fact, with the change in manufacturers' plans that in essence replaced air bags with automatic belts, the central issue in this proceeding has become whether automatic belts would induce higher belt usage rates than are occurring with manual belts.

Many of the comments in the course of this rulemaking were directed specifically at the question of belt use. Most addressed themselves to the information in the docket on the usage witnessed in the VW Rabbit and Chevette equipped with automatic belts.

The Agency's own analysis of the available information concludes that it is virtually impossible to develop an accurate and supportable estimate of future belt use increases based upon the Rabbit and Chevette automatic belt observations. The Agency further believes that it is impossible to disaggregate the roles that demographics, use inducing devices, and automatic aspects of the belt played in the observed increases.

Faced with this level of uncertainty, and the wide margins of possible error, the agency is simply

unable to comply with its statutory mandate to consider and conclude that the automatic restraint requirements are at this time practicable or reasonable within the meaning of the Vehicle Safety Act. On the other hand, the agency is not able to agree with assertions that there will be absolutely no increase in belt use as a result of automatic belts. Certainly, while a large portion of the population appears to find safety belts uncomfortable or refuses to wear them for other reasons, there is a sizeable segment of the population that finds belts acceptable but still does not use them. It is plausible to assume that some people in this group who would not otherwise use manual belts would not disconnect automatic belts.

It is this same population that will generate all of the benefits that result directly and solely from this regulation. This is a population that can also be reached in other ways. The Agency, State governments and the private sector are in the process of expanding and initiating major national belt use educational programs of unprecedented scale. While undertaken entirely apart from the pending proceeding, the fact remains that this effort will predominantly affect the same population that the automatic belts would be aimed at.

On the one hand, it could be argued that, the success of any belt use program would only be enhanced by the installation of automatic belts. Individuals who can be convinced of the utility of safety belts would presumably have an easier time accepting an automatic belt. On the other hand, there is little evidence that the standard itself will materially increase usage levels above those otherwise achievable.

However, the agency is not merely faced with uncertainty as to the actual benefits that would result from detachable automatic safety belts. When the uncertain nature of the benefits is considered together with the risk of adverse safety consequences that might result from the maintenance of this regulation, the agency must conclude that such retention would not be reasonable, and would not meet the need for motor vehicle safety.

It is useful to summarize precisely what the agency believes these risks might be. The principal risk is that adverse public reaction could undermine the effectiveness of both the standard itself and future or related efforts.



The agency also concludes, however, that retention would present serious risk of jeopardizing other separate efforts to increase manual belt usage by the Federal government, States and the private sector. A public that believes it is the victim of too much government regulation by virtue of the standard might well resist such parallel efforts to enhance voluntary belt usage. Further, to the extent that States begin to consider belt use laws as an option, a Federal regulation addressing the same issue could undermine those attempts as well.

While one cannot be certain of the adverse effects on net belt usage increases, it would be irresponsible to fail to consider them. A decision to retain the regulation under any of the schedules now being considered would not get automatic belts on the road until 1983 and would not apply to the entire fleet of new cars until 1984. By the end of the 1984 model year, under most options, there would have been fewer than 20 million vehicles equipped with automatic belts on the road.

By the same time, however, there will be upward of 150 million vehicles equipped with only manual belts, drivers and occupants of which will have been exposed to interim belt usage encouragement efforts.

Agency analysis indicates that external efforts of whatever kind that increase usage by only 5 percent, will save more than 1,300 lives per year beginning in 1983. Installation of automatic belts could save an equal number of lives in 1983 only with 95 percent belt usage.

Further, even if one is convinced that automatic belts can double belt usage and alternative efforts would only increase usage by 5 percent, it would not be until 1989 that total life savings attributable to automatic belts installed under the automatic restraint requirements would reach the total life savings achieved through such other efforts.

NHTSA fully recognizes that neither outcome is a certainty. Much closer to the truth is that both outcomes are uncertain. However, neither is significantly more likely than the other. That being the case, to impose the \$1 billion cost on the public does not appear to be reasonable.

It is particularly unreasonable in light of the fact that the rescission does not foreclose the option to again reopen rulemaking if enhanced usage levels of both manual and automatic belts do not

materialize. Long before there would have been any substantial number of vehicles on the road mandatorily equipped with automatic belts as a result of this standard, NHTSA will conclusively know whether other efforts to increase belt use have succeeded either in achieving acceptable usage levels or in increased public understanding and acceptance of the need for further use-inducing or automatic protection alternatives. If so obviously no further action would be needed. If such is not the case, rulemaking would again be a possibility. Any such rulemaking, following even partially successful efforts to increase belt use, would be much less likely to face public rejection.

It has been said that the Vehicle Safety Act is a "technology-forcing" statute. The agency concurs completely.

However, the issue of automatic restraints now before the agency is not a "technology-forcing" issue. The manual seat belt available in every car sold today offers the same, or more, protection than either the automatic seat belt or the air bag. Instead, the agency today faces a decision to force people to accept protection that they do not choose for themselves. It is difficult to conclude that the Vehicle Safety Act is, or in light of past experience could become, a "people-forcing" statute.

NHTSA cannot find that the automatic restraint requirements meet the need for motor vehicle safety by offering any greater protection than is already available.

After 12 years of rulemaking, NHTSA has not yet succeeded in its original intent, the widespread offering of automatic crash protection that will produce substantial benefits. The agency is still committed to this goal and intends immediately to initiate efforts with automobile manufacturers to ensure that the public will have such types of technology available. If this does not succeed, the agency will consider regulatory action to assure that the last decade's enormous advances in crash protection technology will not be lost.

### **Impact Analyses**

NHTSA has considered the impacts of this final rule and determined that it is a major rulemaking within the meaning of E.O. 12291 and a significant rule within the meaning of the Department of Transportation regulatory policies and procedures. A final regulatory impact analysis is being placed

in the public docket simultaneously with the publication of this notice. A copy of the analysis may be obtained by writing to: National Highway Traffic Safety Administration, Docket Section, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590.

The agency's determination that the rule is major and significant is based primarily upon the substantial savings in variable manufacturing costs and in consumer costs that result from the rescission of the automatic restraint requirements. These costs would have amounted to approximately \$1 billion once all new cars became subject to the requirements. The costs would have recurred annually as long as the requirements remained in effect. There is also a recurring savings in fuel costs of approximately \$150 million annually. Implementation of the automatic restraint requirements would have increased the weight of cars and reduced their fuel economy. In addition, the car manufacturers will be able to reallocate \$400 million in capital investment that they would have had to allocate for the purpose of completing their efforts to comply with the automatic restraint requirements.

The agency finds it difficult to provide a reliable estimate of any adverse safety effects of rescinding the automatic restraint requirements. There might have been significant safety loss if the installation of detachable automatic belts resulted in a doubling of belt usage and if the question were simply one of the implementation or rescission of the automatic restraint requirements. The April 1981 NPRM provided estimates of the additional deaths that might occur as a result of rescission. However, those estimates included carefully drafted caveats. The notice expressly stated that the impacts of rescission would depend upon the usage rate of automatic belts and of the effectiveness of the agency's educational campaign. The agency has now determined that there is no certainty that the detachable automatic belts would produce more than a several percentage point increase in usage. The small number of cars that would have been equipped with automatic belts having use-inducing features or with air bags would not have added more than several more percentage points to that amount. Further, any potential safety losses associated with the rescission must be balanced against the expected results of the agency's planned educational program about

safety belts. That campaign will be addressed to the type of person who might be induced by the detachable automatic belts to begin regular safety belt usage, i.e., the occasional user of manual belts. Since that campaign will affect occasional users in all vehicles on the road today instead of only those in new cars, the campaign can yield substantially greater benefits than the detachable automatic belts even with a much lower effectiveness level.

The agency has also considered the impact of this action on automatic restraint suppliers, new car dealers and small organizations and governmental units. Since the agency certifies that the rescission would not have a significant effect on a substantial number of small entities, a final regulatory flexibility analysis has not been prepared. However, the impacts of the rescission on the suppliers, dealers and other entities are discussed in the final Regulatory Impact Analysis.

The impact on air bag manufacturers is likely to be minimal. Earlier this year, General Motors, Ford and most other manufacturers cancelled their air bag programs for economic reasons. These manufacturers planned instead to rely almost wholly on detachable automatic belts. Therefore, it is not accurate to say, as some commenters did, that rescission of the automatic restraint requirements will "kill" the air bag. Rescission will not affect the air bag manufacturers to any significant degree. Further, the agency plans to undertake new steps to promote the continued development and production of air bags.

The suppliers of automatic belts are generally the same firms that supply manual belts. Thus, the volume of sales of these firms is not expected to be affected by the rescission. However, there will be some loss of economic activity that would have been associated with developing and producing the more sophisticated automatic belts.

The effects of the rescission on new car dealers would be positive. Due to reduced new car purchase prices and more favorable reaction to manual belts than to automatic belts, sales increases of 395,000 cars were estimated by GM and 235,000 cars by Ford. While these figures appear to be overstated, the agency agrees that rescission will increase new car sales.

Small organizations and governmental units would be benefited by the reduced cost of purchasing and operating new cars. Given the indeter-



minacy of the usage rate that detachable automatic belts would have achieved, it is not possible to estimate the effects, if any, of the rescission on the safety of persons employed by these groups.

In accordance with the National Environmental Policy Act of 1969, NHTSA has considered the environmental impacts of the rescission and the alternatives proposed in the April 1981 NPRM. The option selected is disclosed by the analysis to result in the largest reductions in the consumption of plastics, steel, glass and fuel/energy. A Final Environmental Impact Statement is being placed in the public docket simultaneously with the publication of this notice.

This amendment is being made effective in less than 180 days because the date on which the car manufacturers would have to make expenditure commitments to meet the automatic restraint requirements for model year 1983 falls within that 180-day period.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), is amended as set forth below.

## § 571.208 [Amended]

1. S4.1.2 is amended by revising it to read:

S4.1.2 *Passenger cars manufactured on or after September 1, 1973.* Each passenger car manufactured on or after September 1, 1973, shall meet the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3. A protection system that meets the requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3.

2. The heading of S4.1.2.1 is amended by revising it to read:

S4.1.2.1 *First option—frontal/angular automatic protection system.*

\* \* \* \* \*

3. S4.1.3 is removed.

S4.1.3 [Removed]

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 Stat. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on October 23, 1981.

Raymond A. Peck, Jr.,  
*Administrator.*

**46 F.R. 53419**  
**October 29, 1981**



## Appendix

### Editorial

**Note**—This appendix will not appear in the *Code of Federal Regulations*.

Following is a summary of the major comments submitted in response to the April 9, 1981 notice of proposed rulemaking. A more detailed summary of comments has been placed in NHTSA Docket No. 74-14; Notice 22. This summary is organized in broad terms according to the interest groups from which the comments were received.

### Insurance Companies

All commenting insurance companies strongly favored retention of the automatic restraint requirements. Many favored maintaining the present implementation schedule (i.e., September 1, 1982, for large and medium-sized cars and September 1, 1983, for small cars), although several companies stated they would support a change to require that small cars are phased in first or a simultaneous implementation date. Several insurance companies stated that air bags offer the best technology for saving lives and reducing injuries. These companies pointed out that repeated surveys have indicated that consumers appear to favor air bags, even if higher costs are likely. Several insurers argued that a retreat from the standard represents a breach of the Secretary's statutory obligation to reduce traffic accidents and deaths and injuries which result from them. One company argued that a delay in the standard (i.e., the delay and reversal alternative) would produce no measurable economic benefit to car makers and might possibly result in an economic loss to them. Nearly all the companies argued that the standard is cost-beneficial and represents the optimum approach to resolving this country's most pressing public health problem. Many companies stated that reduced insurance premiums resulting from the lives saved and injuries prevented by automatic restraints would help offset the cost of those systems to consumers.

A majority of the insurance companies argued that seat belt use campaigns will not be effective in raising the current use rate of manual belts significantly. The companies pointed to the failures of all past campaigns to have any substantial impact on use rates. On the other hand, these companies believe that the use rate of automatic belts will be significant. The companies point to the cur-

rent use data for automatic belts on VW Rabbits and Chevettes as evidence that automatic belt use will be significant. The companies believe that seat belt use campaigns should only be complementary to automatic restraints, not a substitute.

Several insurance companies pointed to the huge economic losses resulting from traffic accidents. One company stated that these losses mount to over \$1 billion dollars per year and result in recurring costs because of continuing medical problems such as epilepsy and quadriplegia. One company cited Professor William Nordhaus's analysis of the consequences of rescinding the standard as being equivalent to society's loss if the tuberculosis vaccine had not been developed, or if Congress repealed the Clean Air Act. In his submission on behalf of the insurance companies, Professor Nordhaus stated that fatalities will increase by 6,400 each year and injuries by 120,000 if the standard is rescinded. One company argued that the standard is cost-beneficial if automatic belt use rates increase usage only 5 percent. However, this company stated that use rates as high as 70 percent could be expected, and that the costs of rescinding the standard could reach as much as \$2 billion dollars per year. This company also argued that the economic condition of the vehicle industry is no excuse for any delay in the standard and is not a statutorily justified reason for rescinding the standard.

### Consumer Groups and Health Organizations

There were many consumer groups and health-related organizations which strongly urged that the automatic restraint requirements be maintained and that there be no further delays in the implementation schedule. Most of these groups argued that the cost of both air bags and automatic belts are greatly exaggerated by vehicle manufacturers. One group stated that the three alternative proposals are "naive and exhibit a callous disregard for human lives that flouts the agency's mandated safety mission." This group argued that a worse alternative is to rescind the standard and rely on education programs to increase the use of manual belts, since seat belt campaigns have failed repeatedly in this country. The group stated that the simultaneous implementation alternative in March 1983 ignores the industry's background of introducing safety changes only at the beginning of a new model year. Regarding a reversed phase-

in schedule, the group stated that the requirement that small cars have automatic restraints by September 1, 1982, would not likely provide sufficient lead time for small car manufacturers. Additionally, with approximately 2 to 1 difference in seat belt use in small cars versus larger cars, it is not at all clear that the proposed reversal would make up for the delay in implementation in the larger cars in terms of lives saved. The group argued that the best alternative is to maintain the existing implementation schedule.

Several consumer groups argued that the center seating position should not be eliminated from the requirements for several reasons. First, they argued, this position is likely to be occupied by children. Second, the center seat requirement is one factor that will lead to the installation of air bags in some vehicles since current automatic belt designs cannot be applied to the center seat. Nearly all consumer groups argued that benefits of the automatic restraint standard far outweigh the costs.

One association stated that the air bag supplier industry could be forced out of business if substantial modifications and further delays are made to the standard. This would mean, the association argued, that the life-saving air bag technology could be lost forever. The association would support some modifications to the standard if there were some clear commitment by the Department that some car models would be required to offer the consumer the choice of air bags. The group noted that air bag suppliers have indicated that a sufficient production volume would result in air bag systems priced in the \$200 to \$300 dollar range.

Various health groups and medical experts argued that the pain and suffering resulting from epilepsy and paraplegia, as well as mental suffering and physical disfigurement, could be greatly reduced by the automatic restraint standard. These persons argued that the standard should be implemented as soon as possible.

One consumer oriented group did not support the automatic restraint standard. That foundation argued that the standard is not justified, particularly if it is complied with by means of air bags. The group stated that air bag effectiveness is overestimated since the agency does not include non-frontal crashes in its statistics. The organiza-

tion argued that in many situations air bags are actually unsafe. This group also argued that the public acceptability of automatic seat belts is uncertain, and that a well-founded finding of additional safety benefits by the Department is required in order to justify retention of the standard.

### **Vehicle Manufacturers**

The vehicle manufacturers, both foreign and domestic, were unanimously opposed to retention of the automatic restraint standard. Most manufacturers stated the predominate means of complying with the standard would be with automatic belts, and that such belts are not likely to increase usage substantially. This is because most automatic belts will be designed to be easily detachable because of emergency egress considerations and to avoid a potential backlash by consumers that would be counterproductive to the cause of motor vehicle safety. The domestic manufacturers argued that the public would not accept coercive automatic belts (i.e., automatic belts with interlocks or some other use-inducing feature). Eliminating any coercive element produces, in effect, a manual belt, which will be used no more than existing manual systems.

The domestic manufacturers also argued that air bags would not be economically practicable and would, therefore, be unacceptable to the public. One manufacturer noted that current belt users will object strenuously to paying additional money for automatic belts that will not offer any more protection than their existing belts.

One manufacturer argued that the injury criteria specified in the standard is not representative of real injuries and should be replaced with only static test requirements for belt systems. The company argued that there are many problems with test repeatability under the 208 requirements.

All manufacturers of small cars stated that it would be impossible for them to comply with the standard by September 1, 1982, i.e., under the reversal proposal. These manufacturers stated that there is insufficient lead time to install automatic restraints in small cars by that date, and several foreign manufacturers stated they would not be able to sell their vehicles in that model year if the schedule is reversed. Most of the manufacturers, both domestic and foreign, stated that it is also too late to install automatic restraints in their



small cars even six months earlier than the existing schedule, i.e., under the March 1983 simultaneous implementation proposal. Many manufacturers supported a simultaneous implementation if the standard is not rescinded, but requested that the effective date be September 1, 1983, or later. The manufacturers argued that an effective date for small cars prior to September 1, 1983, would not allow enough time to develop acceptable, reliable and high quality automatic belts.

Nearly all vehicle manufacturers believe that an intensive seat belt education campaign can be just as effective as automatic restraints and without the attendant high costs of automatic restraints. Additionally, most foreign manufacturers recommended that mandatory seat belt use laws be enacted in lieu of automatic restraints.

One foreign manufacturer requested that any effective date for automatic restraints be "September 1 or the date of production start of the new model year if this date falls between September 1 and December 31." The company stated that this would allow manufacturers to continue production for several months of models that would then be phased out of production. However, a domestic vehicle manufacturer argued that this would give foreign manufacturers an unfair competitive advantage, and that current practice of September 1 effective dates should be retained.

Most manufacturers supported the proposal to exclude the center seating position from the automatic restraint requirements, in order to give manufacturers more design flexibility. However, the two domestic manufacturers which would be most affected by such an exception stated that it is too late for them to make use of such an exception for 1983 models. The two companies stated that such an exception would have benefits in the long run, however, and would allow them to continue production of six-seat passenger cars in the mid-1980's.

### **Suppliers and Trade Groups**

Suppliers of air bag system components supported continuation of the automatic restraint requirements. One commenter stated that having to buckle-up is an act which requires a series of psychological and physical reactions which are responsible for the low rate of manual seat belts. Also, this company stated that educational campaigns to increase belt use will not work.

One motor vehicle trade group stated that a study by the Canadian government has established the superiority of manual seat belt systems. This group argued that the automatic restraint requirements cannot be justified because any expected benefits are speculative.

One trade group voiced its concern about sodium azide (an air bag propellant) as it pertains to possible hazards posed to the scrap processing industry.

A group representing seat belt manufacturers stated that the most effective way of guaranteeing belt use is through mandatory belt use laws. That group believes that belt usage can be increased through public education, and that simple, easy to use automatic belts such as are currently on the VW Rabbit will also increase belt usage. This group did not support a simultaneous implementation date for automatic restraints, stating that this could put a severe strain on the supplier industry. The group did support elimination of the automatic restraint requirements for center seating positions.

An automobile association recommended equipping small cars with automatic restraints first. The association stated that a reversed phase-in schedule would protect a significantly large segment of the public at an earlier date, would reduce a foreign competitive advantage (under the existing schedule), and would give needed economic relief to large car manufacturers. This organization also recommended that, as an alternative, automatic restraints be required only at the driver's position. This would achieve three-quarters of the reductions in deaths and serious injuries now projected for full-front seat systems, yet cost only half as much.

### **Congressional Comments**

Mr. Timothy E. Wirth, Chairman of the House Subcommittee on Telecommunications, Consumer Protection and Finance, made the following comments:

—The automatic restraint requirements would produce benefits to society far in excess of costs.

—The Committee findings strongly point to the necessity of requiring the installation of automatic crash protection systems, at a minimum, on a substantial portion of the new car fleet at the earliest possible date. Mr. Wirth suggested that the effective date for small cars be September 1, 1982, and for intermediate and large cars September 1, 1983.



—The economic conditions of the automobile industry should not be relevant to the NHTSA's decision on matters of safety. NHTSA's decision must be guided solely by safety-related concerns.

—The agency should not discount its own findings indicating high use of automatic belts (referring to the existing VW and Chevette automatic belt use data).

In a joint letter to the Secretary, eighteen Congressmen urged that the automatic restraint requirements be maintained. This letter noted that over 50,000 people are killed each year on the highways and stated: "While the tragedy of their deaths cannot be measured in economic terms, the tragedy of their serious injuries cost all of us billions of dollars each year in higher insurance costs, increased welfare payments, unemployment and social security payments and rehabilitation costs paid to support the injured and the families of those who have been killed." The letter stressed the Congressmen's belief that the automatic crash protection standard would produce benefits to society far in excess of its cost.

In a letter addressed to Administrator Peck, fifty-nine Congressmen urged that the automatic restraint standard be rescinded. That letter stated: "The 208 standard persists as one of the more controversial federal regulations to be forced on the automobile industry. . . . The industry continues to spend hundreds of thousands of dollars every day in order to meet this standard, despite considerable evidence that any safety benefits realized by enforcing the standard would be minimal."

#### **Private Citizens**

In addition to comments from the above groups and organizations, the agency also received general comments from numerous private citizens. These comments were almost equally divided in their support or opposition to the automatic restraint standard.

Raymond A. Peck, Jr.  
*Administrator*

**46 F.R. 53419**  
**October 29, 1981**

## MOTOR VEHICLE SAFETY STANDARD NO. 208

### Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69-7; Notice No. 9)

**S1. Scope.** This standard specifies performance requirements for the protection of vehicle occupants in crashes.

**S2. Purpose.** The purpose of this standard is to reduce the number of deaths of vehicle occupants, and the severity of injuries, by specifying vehicle crashworthiness requirements in terms of forces and accelerations measured on anthropomorphic dummies in test crashes, and by specifying equipment requirements for active and passive restraint systems.

**S3. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses. In addition, S9, *Pressure vessels and explosive devices*, applies to vessels designed to contain a pressurized fluid or gas, and to explosive devices, for use in the above types of motor vehicles as part of a system designed to provide protection to occupants in the event of a crash.

#### **S4. General requirements.**

##### **S4.1 Passenger cars.**

**S4.1.1 Passenger cars manufactured from January 1, 1972, to August 31, 1973.** Each passenger car manufactured from January 1, 1972, to August 31, 1973, inclusive, shall meet the requirements of S4.1.1.1, S4.1.1.2, or S4.1.1.3. A protection system that meets the requirements of S4.1.1.1 or S4.1.1.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.1.3.

**S4.1.1.1 First option—complete passive protection system.** The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

**S4.1.1.2 Second option—lap belt protection system with belt warning.** The vehicle shall—

(a) At each designated seating position have a Type 1 seat belt assembly or a Type 2 seat belt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard.

(b) At each front outboard designated seating position have a seat belt warning system that conforms to S7.3; and

(c) Meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with respect to anthropomorphic test devices in each front outboard designated seating position restrained only by Type 1 seat belt assemblies.

**S4.1.1.3 Third option—lap and shoulder belt protection system with belt warning.**

**S4.1.1.3.1** Except for convertibles and open-body vehicles, the vehicle shall—

(a) At each front outboard designated seating position have a Type 2 seatbelt assembly that conforms to Standard No. 209 and S7.1 and S7.2 of this standard, with either an integral or detachable upper torso portion, and a seatbelt warning system that conforms to S7.3;

(b) At each designated seating position other than the front outboard positions, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2 of this standard; and

(c) When it perpendicularly impacts a fixed collision barrier, while moving longitudinally forward at any speed up to and including 30 m.p.h., under the test conditions of S8.1 with anthropomorphic test devices at each front outboard position restrained by Type 2 seatbelt assemblies, experience no complete separation of any load-bearing element of a seatbelt assembly or anchorage.

**S4.1.1.3.2** Convertibles and open-body type vehicles shall at each designated seating position have a Type 1 or Type 2 seatbelt assembly that conforms to Standard No. 209 and to S7.1 and S7.2 of this standard, and at each front outboard designated seating position have a seatbelt warning system that conforms to S7.3.

**[S4.1.2 Passenger cars manufactured on or after September 1, 1973.** Each passenger car manufactured on or after September 1, 1973, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3. A protection system that meets the requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3. (46 F.R. 53419—October 29, 1981; effective 12/8/81)]

**S4.1.2.1 First option—frontal/angular automatic protection system.** The vehicle shall—

(a) At each front designated seating position meet the frontal crash protection requirements of S5.1 by means that require no action by vehicle occupants;

(b) At each rear designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2; and

(c) Either—

(1) Meet the lateral crash protection requirements of S5.2 and the rollover crash protection requirements of S5.3 by means that require no action by vehicle occupants; or

(2) At each front designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 through S7.3, and that meets the requirements of S5.1 with front test dummies as required by S5.1, restrained by the Type 1 or Type 2 seat belt assembly (or the pelvic portion of any Type 2 seat belt assembly which has a detachable upper torso belt) in addition to the means that require no action by the vehicle occupant.

**S4.1.2.2 Second option—head-on passive protection system.** The vehicle shall—

(a) At each designated seating position have a Type 1 seat belt assembly or a Type 2 seat belt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard.

(b) At each front designated seating position, meet the frontal crash protection requirements of

S5.1, in a perpendicular impact, by means that require no action by vehicle occupants;

(c) At each front designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with a test device restrained by a Type 1 seatbelt assembly; and

(d) At each front outboard designated seating position, have a seatbelt warning system that conforms to S7.3.

**S4.1.2.3 Third option—lap and shoulder belt protection system with belt warning.**

**S4.1.2.3.1** Except for convertibles and open-body vehicles, the vehicle shall—

(a) At each front outboard designated seating position have a seat belt assembly that conforms to S7.1 and S7.2 of this standard, and a seat belt warning system that conforms to S7.3. The belt assembly shall be either a Type 2 seat belt assembly with a nondetachable shoulder belt that conforms to Standard No. 209 (§ 571.209), or a Type 1 seat belt assembly such that with a test device restrained by the assembly the vehicle meets the frontal crash protection requirements of S5.1 in a perpendicular impact.

(b) At any center front designated seating position, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (§ 571.209) and to S7.1 and S7.2 of this standard, and a seat belt warning system that conforms to S7.3; and

(c) At each other designated seating position, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (§ 571.209) and S7.1 and S7.2 of this standard.

**S4.1.2.3.2** Convertibles and open-body type vehicles shall at each designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (§ 571.209) and to S7.1 and S7.2 of this standard, and at each front designated seating position have a seat belt warning system that conforms to S7.3.

**S4.1.3 [Removed]**

**S4.2 Trucks and multipurpose passenger vehicles with GVWR of 10,000 pounds or less.**

**S4.2.1 Trucks and multipurpose passenger vehicles, with GVWR of 10,000 pounds or less, manufactured from January 1, 1972, to December 31, 1975.** Each truck and multipurpose passenger vehicle with a gross vehicle weight rating of 10,000 pounds or less, manufactured from January 1,



1972, to December 31, 1975, inclusive, shall meet the requirements of S4.2.1.1 or S4.2.1.2, or at the option of the manufacturer, the requirements of S4.2.2. A protection system that meets the requirement of S4.2.1.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.2.1.2.

**S4.2.1.1 First option—complete passive protection system.** The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

**S4.2.1.2 Second option—belt system.** The vehicle shall have seat belt assemblies that conform to Standard 209 installed as follows:

(a) A Type 1 or Type 2 seat belt assembly shall be installed for each designated seating position in convertibles, open-body type vehicles, and walk-in van-type trucks.

(b) In all vehicles except those for which requirements are specified in S4.2.1.2(a), a Type 2 seat belt assembly shall be installed for each outboard designated seating position that includes the windshield header within the head impact area, and a Type 1 or Type 2 seat belt assembly shall be installed for each other designated seating position.

**S4.2.2 Trucks and multipurpose passenger vehicles, with GVWR of 10,000 pounds or less, manufactured on or after January 1, 1976.** Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 10,000 pounds or less, manufactured on or after January 1, 1976, shall meet the requirements of S4.1.2 (as specified for passenger cars), except that forward control manufactured prior to September 1, 1981 vehicles, convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.2.

**S4.2.3 (Reserved)**

**S4.3 Trucks and multipurpose passenger vehicles, with GVWR of more than 10,000 pounds.** Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after January 1, 1972, shall meet the requirements of S4.3.1 or S4.3.2. A protection system that meets the requirements of S4.3.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.2.

**S4.3.1 First option—complete passive protection system.** The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

**S4.3.2 Second option—belt system.** The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to Standard No. 209.

**S4.4 Buses.** Each bus manufactured on or after January 1, 1972, shall meet the requirements of S4.4.1 or S4.4.2.

**S4.4.1 First option—complete passive protection system—driver only.** The vehicle shall meet the crash protection requirements of S5, with respect to an anthropomorphic test device in the driver's designated seating position, by means that require no action by vehicle occupants.

**S4.4.2 Second option—belt system—driver only.** The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to Standard No. 209.

**S4.5 Other general requirements.**

**S4.5.1 Labeling and driver's manual information.** Each vehicle shall have a label setting forth the manufacturer's recommended schedule for the maintenance or replacement, necessary to retain the performance required by this standard, of any crash-deployed occupant protection system. The schedule shall be specified by month and year, or in terms of vehicle mileage, or by intervals measured from the date appearing on the vehicle certification label provided pursuant to 49 CFR Part 567. The label shall be permanently affixed to the vehicle within the passenger compartment and lettered in English in block capitals and numerals not less than three thirty-seconds of an inch high. Instructions concerning maintenance or replacement of a system and a description of the functional operation of the system shall be provided with each vehicle, with an appropriate reference on the label. If a vehicle owner's manual is provided, this information shall be included in the manual.

**S4.5.2 Readiness indicator.** An occupant protection system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. The indicator shall monitor its own readiness and shall be clearly visible from the driver's designated seating position. A list of the elements of the system being monitored by the

indicator shall be included with the information furnished in accordance with S4.5.1 but need not be included on the label.

**S4.5.3 Automatic belts.** Except as provided in S4.5.3.1, a seat belt assembly that requires no action by vehicle occupants (hereinafter referred to as a "passive belt") may be used to meet the crash protection requirements of any option under S4 and in place of any seat belt assembly otherwise required by that option.

**S4.5.3.1** An automatic belt that provides only pelvic restraint may not be used pursuant to S4.5.3 to meet the requirements of an option that requires a Type 2 seat belt assembly.

**S4.5.3.2** An automatic belt, furnished pursuant to S4.5.3, that provides both pelvic and upper torso restraint may have either a detachable or nondetachable upper torso portion, notwithstanding provisions of the option under which it is furnished.

**S4.5.3.3** A passive belt furnished pursuant to S4.5.3 shall—

(a) Conform to S7.1 and have a single emergency release mechanism whose components are readily accessible to a seated occupant.

**[S4.5.3.3(b)]** In place of a warning system that conforms to S7.3 of this standard, be equipped with the following warning system:

At the left front outboard designated seating position (driver's position), be equipped with a warning system that activates a continuous or intermittent audible signal for a period of not less than 4 seconds and not more than 8 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position) when condition (A) exists simultaneously with condition (B), and that activates a continuous or flashing warning light, visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of FMVSS 101-80 or, at the option of the manufacturer for vehicles manufactured before September 1, 1980, displaying the words "Fasten Seat Belts" or "Fasten Belts" for as long as condition (A) exists simultaneously with either condition (B) or condition (C).

(A) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(B) The driver's automatic belt is not in use, as determined by the belt latch mechanism not being

fastened or, if the automatic belt is nonseparable, by the emergency release mechanism being in the released position.

(C) The belt webbing of a motorized automatic belt system is not in its locked, protective mode at the anchorage point. (46 F.R. 2064—January 8, 1981. Effective: 9/1/82)]

**S4.5.3.4** An automatic belt furnished pursuant to S4.5.3 that is not required to meet the perpendicular frontal crash protection requirements of S5.1 shall conform to the webbing, attachment hardware, and assembly performance requirements of Standard No. 209.

## **S5. Occupant crash protection requirements.**

**S5.1 Frontal barrier crash.** When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30° in either direction from the perpendicular to the line of travel of the vehicle, under the applicable conditions of S8, with anthropomorphic test devices at each designated seating position described in (a) or (b) for which a barrier crash test is required under S4, it shall meet the injury criteria of S6. An anthropomorphic test device shall be placed—

(a) In the case of a vehicle equipped with front bucket seats, at each front designated seating position; and

(b) In the case of a vehicle equipped with a front bench seat, at the driver's designated seating position and at any other one front designated seating position.

**S5.2 Lateral moving barrier crash.** When the vehicle is impacted laterally on either side by a barrier moving at 20 mph, with a test device at the front outboard designated seating position adjacent to the impacted side, under the applicable conditions of S8, it shall meet the injury criteria of S6.2 and S6.3.

**S5.3 Rollover.** When the vehicle is subjected to a rollover test in either lateral direction at 30 mph with a test device in the front outboard designated seating position on its lower side as mounted on the test platform, under the applicable conditions of S8, it shall meet the injury criteria of S6.1.

## **S6. Injury criteria.**

**S6.1** All portions of the test device shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.



**S6.2** The resultant acceleration at the center of gravity of the head shall be such that the expression:

$$\left[ \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a \, dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000 where  $a$  is the resultant acceleration expressed as a multiple of  $g$  (the acceleration of gravity), and  $t_1$  and  $t_2$  are any two points in time during the crash. However, in the case of a passenger car manufactured before August 31, 1976, or a truck or multipurpose passenger vehicle with a GVWR of 10,000 pounds or less manufactured before August 15, 1977, when the dummy is restrained by a seat belt system,  $t_1$  and  $t_2$  are any two points in time during any interval in which the head is in continuous contact with a part of the vehicle other than the belt system.

**S6.3** The resultant acceleration at the center of gravity of the upper thorax shall not exceed 60g, except for intervals whose cumulative duration is not more than 3 milliseconds. However, in the case of a passenger car manufactured before August 31, 1976, or a truck or multipurpose passenger vehicle with a GVWR of 10,000 pounds or less manufactured before August 15, 1977, the resultant acceleration at the center of gravity of the upper thorax shall be such that the severity index calculated by the method described in SAE Information Report J885a, October 1966, shall not exceed 1,000.

**S6.4** The compressive force transmitted axially through each upper leg shall not exceed 2,250 pounds.

## **S7. Seat belt assembly requirements—passenger cars.**

### **S7.1 Adjustment.**

**S7.1.1** Except as specified in S7.1.1.1 and S7.1.1.2, the lap belt of any seat belt assembly furnished in accordance with S4.1.1 and S4.1.2 shall adjust by means of an emergency-locking or automatic-locking retractor that conforms to Standard No. 209 to fit persons whose dimensions range from those of a 50th-percentile 6-year-old child to those of a 95th-percentile adult male and the upper torso restraint shall adjust by means of

an emergency-locking retractor or a manual adjusting device that conforms to Standard No. 209 to fit persons whose dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male, with the seat in any position and the seat back in the manufacturer's nominal design riding position. However, an upper torso restraint furnished in accordance with S4.1.2.3.1(a) shall adjust by means of an emergency-locking retractor that conforms to Standard No. 209.

**S7.1.1.1** A seat belt assembly installed at the driver's seating position shall adjust to fit persons whose dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male.

**[S7.1.1.2. (a)** A seat belt assembly installed in a motor vehicle other than a forward control vehicle at any designated seating position other than the outboard positions of the front and second seats shall adjust either by a retractor as specified in § 7.1.1 or by a manual adjusting device that conforms to § 571.209.

(b) A seat belt assembly installed in a forward control vehicle at any designated seating position other than the front outboard seating positions shall adjust either by a retractor as specified in § 7.1.1 or by a manual adjusting device that conforms to § 571.209. (45 F.R. 20103—March 27, 1980; Effective:3/27/80)]

**[S7.1.1.3** A lap belt installed at any front outboard designated seating position in a vehicle



manufactured on or after September 1, 1982, shall meet the requirements of this section by means of an emergency-locking retractor that conforms to Standard No. 209.

**S7.1.1.4** Notwithstanding the other provisions of S7.1–S7.1.1.3, emergency-locking retractors on belt assemblies located in positions other than front outboard designated seating positions may be equipped with a manual webbing adjustment device capable of causing the retractor that adjusts the lap belt to lock when the belt is buckled. (46 F.R. 2064—January 8, 1981. Effective: 9/1/82)】

	50th-percentile 6-year-old child	5th-percentile adult female	50th-percentile adult male	95th-percentile adult male
Weight	47.3 pounds	102 pounds	164 pounds	215 pounds
Erect sitting height	25.4 inches	30.9 inches	35.7 inches	38 inches
Hip breadth (sitting)	8.4 inches	12.8 inches	14.5 inches	16.5 inches
Hip circumference (sitting)	23.9 inches	36.4 inches	42 inches	47.2 inches
Waist circumference (sitting)	20.8 inches	23.6 inches	33 inches	42.5 inches
Chest depth		7.5 inches	9 inches	10.5 inches
Chest circumference:				
(nipple)		30.5 inches		
(upper)		29.8 inches	37.7 inches	44.5 inches
(lower)		26.6 inches		

**S7.2 Latch mechanism.** A seat belt assembly installed in a passenger car, except an automatic belt assembly, shall have a latch mechanism:

(a) Whose components are accessible to a seated occupant in both the stowed and operational positions;

(b) That releases both the upper torso restraint and the lap belt simultaneously, if the assembly has a lap belt and an upper torso restraint that require unlatching for release of the occupant; and

(c) That releases at a single point by a push-button action.

【**S7.3** A seat belt assembly provided at the driver's seating position shall be equipped with a warning system that activates, for a period of not

**S7.1.2** The intersection of the upper torso belt with the lap belt in any Type 2 seat belt assembly furnished in accordance with S4.1.1 or S4.1.2, with the upper torso manual adjusting device, if provided, adjusted in accordance with the manufacturer's instructions, shall be at least 6 inches from the front vertical centerline of a 50th-percentile adult male occupant, measured along the centerline of the lap belt, with the seat in its rearmost and lowest adjustable position and with the seat back in the manufacturer's nominal design riding position.

**S7.1.3** The weights and dimensions of the vehicle occupants specified in this standard are as follows:

less than 4 seconds and not more than 8 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position), a continuous or flashing warning light, visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of Federal Motor Vehicle Safety Standard No. 101-80 or, at the option of the manufacturer for vehicles manufactured before September 1, 1980, displaying the words "Fasten Seat Belts" or "Fasten Belts" when condition (a) exists, and a continuous or intermittent audible signal when condition (a) exists simultaneously with condition (b).

(a) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(b) The driver's lap belt is not in use, as determined at the option of the manufacturers, either by the belt latch mechanism not being fastened, or by the belt not being extended at least 4 inches from its stowed position. (45 F.R. 47151—July 14, 1980. Effective: 7/14/80)】

**S7.3.1 [Deleted]**

**S7.3.2 [Deleted]**

**S7.3.3 [Deleted]**

**S7.3.4 [Deleted]**

**S7.3.5 [Deleted]**

**S7.3.5.1 [Deleted]**

**S7.3.5.2 [Deleted]**

**S7.3.5.3 [Deleted]**

**S7.3.5.4 [Deleted]**

**S7.3a [Deleted]**

**[S7.4 Seat belt comfort and convenience.**

(a) Automatic seat belts installed in any vehicle with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1982, shall meet the requirements of S7.4.1, S7.4.2, and S7.4.3.

(b) Manual seat belts, other than manual Type 2 belts in front seating positions in passenger cars, installed in any vehicle with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1982, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

**S7.4.1 Convenience hooks.** Any manual convenience hook or other device that is provided to stow seat belt webbing to facilitate entering and exiting the vehicle shall automatically release the webbing and shall remain in the released mode for as long as (a) exists simultaneously with (b), at the manufacturer's option where applicable, or for as long as (a) exists simultaneously with (c)—

(a) The vehicle ignition switch is moved to the "on" or "start" position;

(b) The vehicle's drive train is engaged;

(c) In the case of manual transmission vehicles, the vehicle's parking brake is in the released mode (not engaged).

**S7.4.2 Webbing tension-relieving device.** Any automatic seat belt assembly that includes either manual or automatic devices that permit the introduction of slack in the webbing of the upper torso restraint (e.g., "comfort clips" or "window-shade" devices) shall comply with the injury criteria of S5 of this standard with the belt webbing in any position to which it can be adjusted. Any belt slack that can be introduced into the belt system by means of any tension-relieving device or design shall be cancelled each time the adjacent vehicle door is opened.

**S7.4.3 Belt contact force.** When tested in accordance with S10.6, the upper torso webbing of any seat belt assembly shall not exert more than 0.7 pounds of contact force when measured normal

to and one inch from the chest of an anthropomorphic test dummy, positioned in accordance with S8.1.11 in the seating position for which that assembly is provided, at the point where the centerline of the torso belt crosses the midsagittal line on the dummy's chest.

**S7.4.4 Latchplate access.** The latchplate of any seat belt assembly shall be located within the outboard reach envelope of either the outboard arm or the inboard arm described in S10.5 and Figure 3 of this standard. There shall be sufficient clearance between the vehicle seat and the side of the vehicle interior to allow unhindered transit of the test block defined in Figure 4 of this standard to the latchplate or buckle.

**S7.4.5 Retraction.** When tested under the conditions of S8.1.2 and S8.1.3, with anthropomorphic test dummies whose arms have been removed positioned in the front outboard designated seating position in accordance with S8.1.11, and restrained by the belt systems for those positions, the torso and lap belt webbing of any of those seat belt systems shall automatically retract to their completely stowed position when the latchplate is released from the buckle and the adjacent vehicle door is in the open position.

**S7.4.6 Seat belt guides and hardware.**

**S7.4.6.1** Except for rear seats that tumble, the webbing of a manual seat belt assembly that is designed to pass through the seat cushion or between the seat cushion and seat back shall pass either through guide openings in the surface of the seat cushion or through flexible conduits between the seat cushion and seat back to maintain the location of the seat belt latchplate and buckle on the seat cushion.

**S7.4.6.2** The buckle and latchplate of a manual seat belt assembly subject to S7.4.6.1 shall not pass through the guides or conduits provided for in S7.4.6.1 and fall behind the seat when the events listed below occur in the order specified: (a) the belt is completely retracted or, if the belt is nonretractable, the belt is unlatched; (b) the seat is moved to any position to which it is designed to be adjusted; and (c) the seat back, if foldable, is folded forward as far as possible and then moved backward into position. The inboard receptacle end of a seat belt assembly installed at a front outboard designated seating position shall be accessible with the center arm rest in any position to which it can be adjusted (without having to move the armrest). (46 F.R. 2064—January 8, 1981. Effective: 9/1/82)]

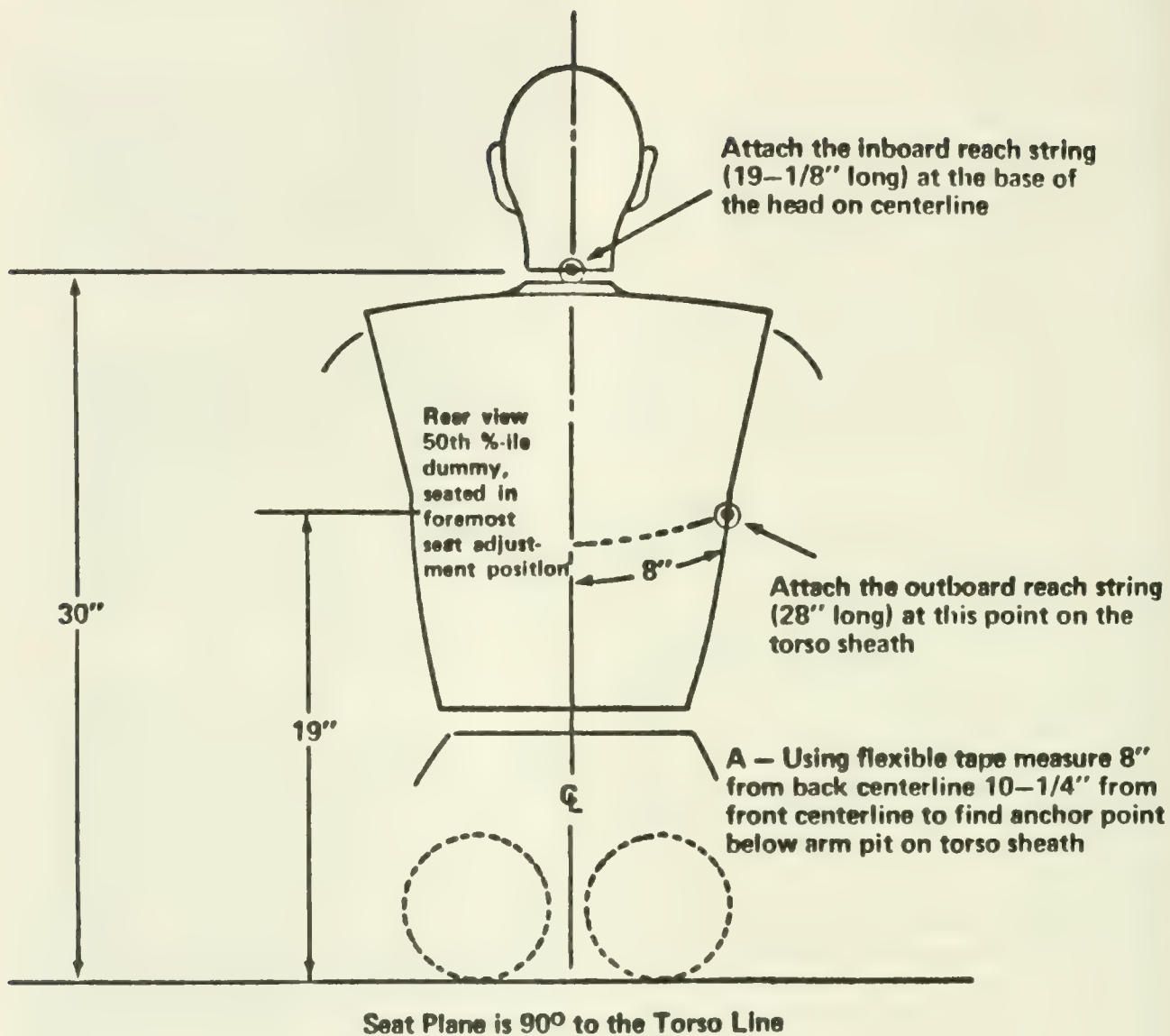


Figure 3—LOCATION OF ANCHORING POINTS FOR LATCHPLATE REACH LIMITING CHAINS OR STRINGS TO TEST FOR LATCHPLATE ACCESSIBILITY



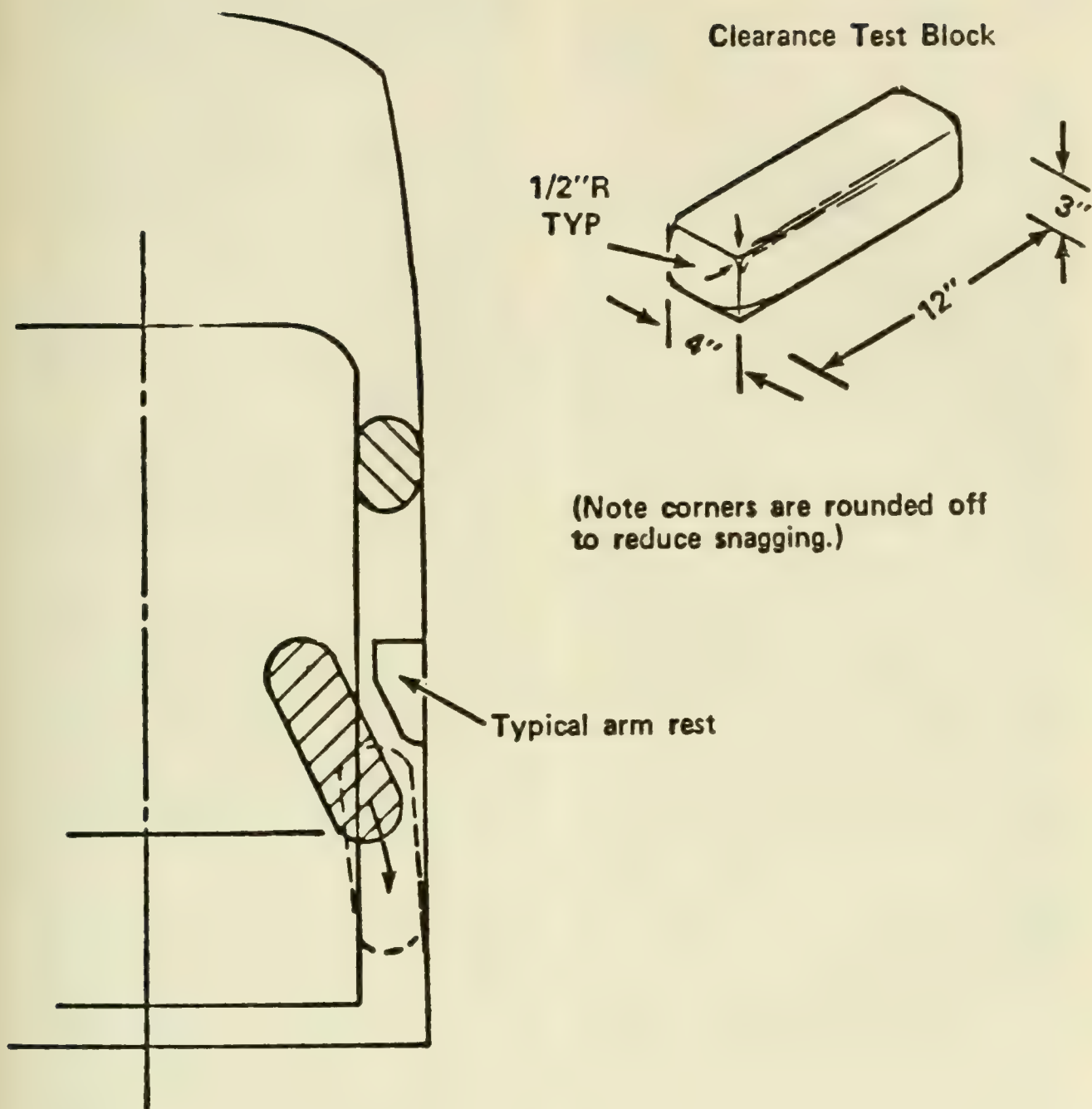


Figure 4—USE OF CLEARANCE TEST BLOCK TO DETERMINE HAND/ARM ACCESS

## **S8. Test conditions.**

**S8.1 General conditions.** The following conditions apply to the frontal, lateral, and rollover tests.

**S8.1.1** The vehicle, including test devices and instrumentation, is loaded as follows:

(a) *Passenger cars.* A passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus the weight of the necessary anthropomorphic test devices.

(b) *Multipurpose passenger vehicles, trucks, and buses.* A multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight plus 300 pounds or its rated cargo and luggage capacity weight, whichever is less, secured in the load carrying area and distributed as nearly as possible in proportion to its gross axle weight ratings, plus the weight of the necessary anthropomorphic test devices.

**S8.1.2** Adjustable seats are in the adjustment position midway between the forwardmost and rearmost positions, and if separately adjustable in a vertical direction, are at the lowest position. If an adjustment position does not exist midway between the forwardmost and rearmost positions, the closest adjustment position to the rear of the midpoint is used.

**S8.1.3** Adjustable seat backs are in the manufacturer's nominal design riding position. If a nominal position is not specified, the seat back is positioned so that the accelerometer surface in the dummy head, as positioned in the vehicle, is horizontal. If the vehicle is equipped with adjustable head restraints, each is adjusted to its highest adjustment position.

**S8.1.4** Adjustable steering controls are adjusted so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.

**S8.1.5** Movable vehicle windows and vents are in the fully closed position.

**S8.1.6** Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.

**S8.1.7** Doors are fully closed and latched but not locked.

**S8.1.8** [Anthropomorphic test devices used for the evaluation of restraint systems manufactured

pursuant to applicable portions of sections S4.1.2 and S4.1.3 shall conform to the requirements of Subpart B of Part 572 of this title for a 50th percentile adult male dummy. (46 F.R. 2064—January 8, 1981. Effective: 9/1/82)]

**S8.1.9** Each test dummy is clothed in form-fitting cotton stretch garments with short sleeves and midcalf length pants. Each foot of the dummy is equipped with a size 11EE shoe which meets the configuration, size, sole, and heel thickness specifications of MIL-S-13192 and weighs  $1.25 \pm 0.2$  pounds.

**S8.1.10** Limb joints are set at 1g, barely restraining the weight of the limb when extended horizontally. Leg joints are adjusted with the torso in the supine position.

**S8.1.11 Dummy placement in vehicle.** Anthropomorphic test dummies are placed in the vehicle in accordance with S8.1.11.1 and S8.1.11.2 and except as otherwise specified the dummies are not restrained during an impact by any means that require occupant action.

**S8.1.11.1 Vehicle equipped with front bucket seats.** In the case of a vehicle equipped with front bucket seats, dummies are placed at the front outboard designated seating positions with the test device torso against the seat back, and the thighs against the seat cushion to the extent permitted by placement of the dummy's feet in accordance with the appropriate paragraph of S8.1.11. The dummy is centered on the seat cushion of the bucket seat and its midsagittal plane is vertical and longitudinal.

**S8.1.11.1.1 Driver position placement.** At the driver's position, the knees of the dummy are initially set 14.5 inches apart, measured between the outer surfaces of the knee pivot bolt heads, with the left outer surface 5.9 inches from the midsagittal plane of the dummy. The right foot of the dummy rests on the undepressed accelerator pedal with the rearmost point of the heel on the floorpan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, it is set perpendicular to the tibia and placed as far forward as possible in the direction of the geometric center of the pedal with the rearmost point of the heel resting on the floorpan. The plane defined by the femur and tibia centerlines of the right leg is as close as possible to vertical without inducing torso movement and except as prevented by contact

with a vehicle surface. The left foot is placed on the toeboard with the rearmost point of the heel resting on the floorpan as close as possible to the point of intersection of the planes described by the toeboard and the floorpan. If the foot cannot be positioned on the toeboard, it is set perpendicular to the tibia and placed as far forward as possible with the heel resting on the floorpan. The femur and tibia centerlines of the left leg fall in a vertical plane except as prevented by contact with a vehicle surface.

**S8.1.11.1.2 Passenger position placement.** At the right front designated seating position, the femur, tibia, and foot centerlines of each of the dummy's legs fall in a vertical longitudinal plane. The feet of the dummy are placed on the toeboard with the rearmost point of the heel resting on the floorpan as close as possible to the point of intersection of the planes described by the toeboard and the floorpan. If the feet cannot be positioned flat on the toeboard they are set perpendicular to the tibia and are placed as far forward as possible with the heels resting on the floorpan.

**S8.11.2 Vehicle equipped with bench seating.** In the case of a vehicle which is equipped with a front bench seat, a dummy is placed at the left front outboard designated seating position and at one of the two other designated seating positions (or at the only other seating position if only one is provided), with the dummy torso against the seat back and the thighs against the seat cushion to the extent permitted by placement of the dummy's feet in accordance with the appropriate paragraph of S8.1.11.1.

**S8.1.11.2.1 Driver position placement.** The dummy is placed at the left front outboard designated seating position so that its midsagittal plane is vertical and longitudinal, and passes through the center point of the plane described by the steering wheel rim. The legs, knees, and feet of the dummy are placed as specified in S8.1.11.1.1.

**S8.1.11.2.2 Center position placement.** If a dummy is placed in the center front designated seating position, it is placed so that its midsagittal plane is vertical and longitudinal, and 19.5 inches to the right of the midsagittal plane of the dummy at the driver's position. In the case of a vehicle with a drive line tunnel, the left foot of the dummy is placed flat on the floor so that the centerline of the foot is coincident with the centerline of the vehicle,

as far forward as possible without touching any other vehicle component. The left knee is located such that a plane defined by the femur centerline and tibia centerline is as close as possible to the vertical without inducing torso movement. The right foot of the dummy is placed on the toeboard with the rearmost point of the heel resting at the intersection of the toeboard and the floorpan and the left side of the dummy's right shoe sole in contact with the drive line tunnel where it intersects the plane of the floorpan. If the foot cannot be placed on the toeboard it is set perpendicular to the tibia and placed as far forward as possible with the heel resting on the floorpan and the left side of the dummy's right shoe sole in contact with the drive line tunnel where it intersects the plane of the floorpan. The right knee is located such that the plane defined by the femur centerline and the tibia centerline is as close as possible to the vertical without inducing torso displacement or rotation. If the vehicle has no drive line tunnel, leg and foot placement conform to the conditions of S8.1.11.1.2.

**S8.1.11.2.3 Passenger position placement.** The dummy is placed at the right front outboard designated seating position as specified in S8.1.11.1.2, except that the midsagittal plane of the dummy is vertical, longitudinal, and the same distance from the longitudinal centerline as the midsagittal plane of the dummy at the driver's position.

**S8.1.12 Instrumentation** does not affect the motion of dummies during impact or rollover.

**S8.1.1.13** The stabilized temperature of the test instrument specified by S8.1.8 is at any level between 66° F. and 78° F.

**S8.2 Lateral moving barrier crash test conditions.** The following conditions apply to the lateral moving barrier crash test:

**S8.2.1** The moving barrier, including the impact surface, supporting structure, and carriage, weighs 4,000 pounds.

**S8.2.2** The impact surface of the barrier is a vertical, rigid, flat rectangle, 78 inches wide and 60 inches high, perpendicular to its direction of movement, with its lower edge horizontal and 5 inches above the ground surface.

**S8.2.3** During the entire impact sequence the barrier undergoes no significant amount of dynamic or static deformation, and absorbs no significant portion of the energy resulting from the



impact, except for energy that results in translational rebound movement of the barrier.

**S8.2.4** During the entire impact sequence the barrier is guided so that it travels in a straight line, with no significant lateral, vertical or rotational movement.

**S8.2.5** The concrete surface upon which the vehicle is tested is level, rigid and of uniform construction, with a skid number of 75 when measured in accordance with American Society for Testing and Materials Method E-274-65T at 40 mph, omitting water delivery as specified in paragraph 7.1 of that method.

**S8.2.6** The tested vehicle's brakes are disengaged and the transmission is in neutral.

**S8.2.7** The barrier and the test vehicle are positioned so that at impact—

- (a) The vehicle is at rest in its normal attitude;
- (b) The barrier is traveling in a direction perpendicular to the longitudinal axis of the vehicle at 20 mph; and
- (c) A vertical plane through the geometric center of the barrier impact surface and perpendicular to that surface passes through the driver's seating reference point in the tested vehicle.

**S8.3 Rollover test conditions.** The following conditions apply to the rollover test:

**S8.3.1** The tested vehicle's brakes are disengaged and the transmission is in neutral.

**S8.3.2** The concrete surface on which the test is conducted is level, rigid, of uniform construction, and of a sufficient size that the vehicle remains on it throughout the entire rollover cycle. It has a skid number of 75 when measured in accordance with American Society of Testing and Materials Method E-274-65T at 40 mph omitting water delivery as specified in paragraph 7.1 of that method.

**S8.3.3** The vehicle is placed on a device, similar to that illustrated in Figure 1, having a platform in the form of a flat, rigid plane at an angle of 23° from the horizontal. At the lower edge of the platform is an unyielding flange, perpendicular to the platform with a height of 4 inches and a length sufficient to hold in place the tires that rest against it. The intersection of the inner face of the flange with the upper face of the platform is 9 inches above the rollover surface. No other restraints are used to hold the vehicle in position during the

deceleration of the platform and the departure of the vehicle.

**S8.3.4** With the vehicle on the test platform, the test devices remain as nearly as possible in the posture specified in S8.1.

**S8.3.5** Before the deceleration pulse, the platform is moving horizontally, and perpendicularly to the longitudinal axis of the vehicle, at a constant speed of 30 mph for a sufficient period of time for the vehicle to become motionless relative to the platform.

**S8.3.6** The platform is decelerated from 30 to 0 mph in a distance of not more than 3 feet, without change of direction and without transverse or rotational movement during the deceleration of the platform and the departure of the vehicle. The deceleration rate is at least 20g for a minimum of 0.04 seconds.

## **S9. Pressure vessels and explosive devices.**

**S9.1 Pressure vessels.** A pressure vessel that is continuously pressurized shall conform to the requirements of 49 CFR § 178.65-2, -6(b), -7, -9(a) and (b), and -10. It shall not leak or evidence visible distortion when tested in accordance with § 178.65-11(a) and shall not fail in any of the ways enumerated in § 178.65-11(b) when hydrostatically tested to destruction. It shall not crack when flattened in accordance with § 178.65-12(a) to the limit specified in § 178.65-12(a) (4).

**S9.2 Explosive devices.** An explosive device shall not exhibit any of the characteristics prohibited by 49 CFR § 173.51. All explosive material shall be enclosed in a structure that is capable of containing the explosive energy without sudden release of pressure except through overpressure relief devices or parts designed to release the pressure during actuation.

**S10. Dummy positioning procedures.** The dummy is positioned on a seat as specified in S10.1 through S10.3 to achieve the conditions of S8.1.11.

**S10.1 Initial dummy placement.** With the dummy at its designated seating position as described in S8.1.11, place the upper arms against the seat back and tangent to the side of the upper torso and the lower arms and palms against the outside of the thighs.

**S10.2 Dummy settling.** With the dummy positioned as specified in S10.1, slowly lift the dummy in the direction parallel to the plane of the seat

back until its buttocks no longer contact the seat cushion or until its head contacts the vehicle roof. Using a flat, square, rigid surface with an area of 9 square inches and oriented so that its edges fall in longitudinal or horizontal planes, apply a force of 50 pounds through the center of the rigid surface against the dummy's torso in the horizontal rearward direction along a line that is coincident with the midsagittal plane of the dummy and 5.5 inches above the bottom surface of its buttocks. Slowly remove the lifting force.

**S10.2.1** While maintaining the contact of the force application plate with the torso, remove as much force as is necessary from the dummy's torso to allow the dummy to return to the seat cushion by its own weight.

**S10.2.2** Without removing the force applied to the lower torso, apply additional force in the horizontal, forward direction, longitudinally against the upper shoulders of the dummy sufficient to flex the torso forward until the dummy's back above the lumbar spine no longer contacts the seat back. Rock the dummy from side to side three times, so that the dummy spine is at any angle from the vertical of not less than 14° and not more than 16° at the extreme of each movement. With the midsagittal plane vertical, push the upper half of the torso back against the seat back with a force of 50 pounds applied in the horizontal rearward direction along a line that is coincident with the midsagittal plane of the dummy and 18 inches above the bottom surface of its buttocks. Slowly remove the horizontal force.

**S10.3 Placement of dummy arms and hands.** With the dummy positioned as specified in S10.2 and without inducing torso movement, place the arms, elbows, and hands of the dummy, as appropriate for each designated seating position in accordance with S10.3.1 or S10.3.2. Following placement of the limbs, remove the force applied against the lower half of the torso.

**S10.3.1 Driver's position.** Move the upper and the lower arms of the dummy at the driver's position to fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the dummy's thumbs over the steering wheel rim, positioning the upper and lower arm centerlines as

close as possible in a vertical plane without inducing torso movement.

**S10.3.2 Passenger position.** Move the upper and the lower arms of the dummy at the passenger position to fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the upper arm contacts the seat back and is tangent to the upper part of the side of the torso, the palm contacts the outside of the thigh, and the little finger is barely in contact with the seat cushion.

**S10.4 Head adjustment.** Without inducing torso movement, position the head so that the surface of the transverse instrumentation mounting platform in the head is horizontal and the head midsagittal plane falls in a longitudinal plane.

**[S10.5** The reach envelopes specified in S7.4.7 are obtained by positioning an anthropomorphic test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

**S10.6** To determine compliance with S7.4.3 of this standard, position the anthropomorphic test dummy in the vehicle in accordance with S8.1.11 and under the conditions of S8.1.2 and S8.1.3. Pull the belt webbing three inches from the dummy's chest and release until the webbing is within 1 inch of the dummy's chest and measure belt pressure. (46 F.R. 2064—January 8, 1981. Effective: 9/1/82)]

**S11.** On and before August 31, 1981, a manufacturer, at its option in place of the conditions specified in S10 and the procedures specified in S8.1.2, S8.1.3, S8.1.9, and S8.1.11 through S8.1.13, may follow the procedures of S11.1 through S11.8.

**S11.1** Adjustable seats are in the adjustment position midway between the forwardmost and rearmost positions, and if separately adjustable in a vertical direction, are at the lowest position.

**S11.2** Adjustable seat backs are in the manufacturer's nominal design riding position.

**S11.3** Each test device is clothed in form-fitting cotton stretch garments.



**S11.4** Each test device is firmly placed in a designated seating position in the following manner:

(a) The head is aligned by placing the test device on its back on a rigid, level surface and by adjusting the head so that it touches the level surface and is laterally centered with respect to the device's axis of symmetry.

(b) The test device is placed in the vehicle in the normal upright sitting posture, and a rigid roller, 6 inches in diameter and 24 inches long, is placed transversely as low as possible against the front of the torso.

(c) The roller is pressed horizontally against the torso with a force of 50 pounds.

(d) Force is applied at the shoulder level to bend the torso forward over the roller, flexing the lower back, and to return the test device to the upright sitting posture.

(e) The roller is slowly released.

**S11.5** Except as otherwise herein specified, the test devices are not restrained during impacts by any means that require occupant action.

**S11.6** The hands of the test device in the driver's designated seating position are on the steering wheel rim at the horizontal centerline. The right foot rests on the undepressed accelerator pedal, with the heel in contact with the point where the centerline of the upper surface of the undepressed accelerator pedal intersects the upper surface of the floor covering. The left leg is placed as in S11.7.

**S11.7** The hands of each other test device are resting on the seat with the palms touching the legs, and the upper arms are resting against the seat back and flush with the body. Where possible, the legs are outstretched, with the thighs on the seat and the heels touching the floor with the foot at 90° to the tibia. Otherwise, the tibia are vertical with the feet resting on the floor. The left leg of a test device in the center front designated seating

position is on the vehicle centerline, and the right leg is in the right footwell. The left and right legs of a test device in the center rear designated seating position are in the left and right footwells, respectively.

**S11.8** Instrumentation does not affect the motion of test devices during impact or rollover.

### Interpretation

Several persons have raised questions as to what constitutes a "passive" restraint system—one that requires "no action by vehicle occupants"—as those concepts are used in Standard No. 208, Occupant Crash Protection (36 F.R. 4600, March 10, 1971), effective January 1, 1972. Specifically, it has been asked whether occupant protection systems that require occupants to take protective action as a prerequisite to entering, seating themselves in, or operating a vehicle can qualify as a system that requires "no action." One commonly discussed example of such "forced action" systems is a seat belt interlock, which requires a seat belt to be fastened before the vehicle ignition system is operative.

The concept of an occupant protection system that requires "no action by vehicle occupants" as used in Standard No. 208 is intended to designate a system that requires no action other than would be required if the protective system were not present in the vehicle. Under this interpretation the concept does not include "forced action" systems as described above.

This interpretation is not intended to rule out the possibility that further rulemaking action may be taken in the future to permit such systems in certain cases.

**36 F.R. 4600  
March 10, 1971**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209****Seat Belt Assemblies—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses**

Motor Vehicle Safety Standard No. 209 (32 F.R. 2415, as amended 32 F.R. 3310), specifies requirements for seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks and buses, incorporating by reference the requirements of Department of Commerce, National Bureau of Standards, *Standards for Seat Belts for Use in Motor Vehicles* (15 C.F.R. Part 9; 31 F.R. 11528).

The Administrator of the Federal Highway Administration has determined in the interests of clarity and ease of reference that the requirements specified by 15 C.F.R. Part 9 should be incorporated into Standard No. 209 where it is presently incorporated only by reference. Therefore Standard No. 209 is hereby amended by deleting present paragraph S3 and adding new paragraphs S3, S4, and S5, so as to incorporate the requirements of 15 C.F.R. Part 9. Accordingly 15 C.F.R. Part 9 is hereby deleted.

Since this amendment imposes no additional burden on any person and involves no substantive change in the requirements of Standard No. 209, notice and public procedure hereon are unnecessary and good cause is shown that an effective

date earlier than 180 days after issuance is in the public interest and the amendment may be made effective less than 30 days after publication in the *Federal Register*. The requirement of former Paragraph S3 of Standard No. 209 that seat belt assemblies shall use the attachment hardware specified in 15 C.F.R. § 9.3(f) "or approved equivalent hardware" has been incorporated into new Paragraph S4.1(f) of Standard No. 209.

This amendment is made under the authority of sections 103, 117(c) and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. secs. 1392, 1405(c), and 1407) and the delegation of authority contained in the Regulations of the Office of the Secretary (49 C.F.R. § 1(c)), and is effective upon publication in the *Federal Register*.

Issued in Washington, D.C., on December 24, 1968.

Lowell K. Bridwell,  
Federal Highway Administrator

34 F.R. 115  
January 4, 1969



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209****Seat Belt Assemblies in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses  
(Docket No. 69-23; Notice No. 2)**

This notice amends Federal Motor Vehicle Safety Standard No. 209 in § 571.21 of Title 49 of the Code of Federal Regulations, to upgrade the requirements for seatbelt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses. As amended, the standard is both an equipment and a vehicle standard. The equipment aspect applies to a seatbelt assembly manufactured on or after the effective date. The vehicle aspect applies to an assembly installed in a vehicle manufactured on or after the effective date, regardless of when the assembly was manufactured.

During the period since the original issuance of Standard No. 209, laboratory tests and experience with actual seatbelt usage have disclosed areas where improvements in performance requirements are necessary. Consequently, a notice of proposed amendments to the standard was published on March 17, 1970 (35 F.R. 4641) to upgrade the performance requirements for seatbelt assemblies. Interested persons were given an opportunity to comment on the contents of the proposed rule. These comments, and other available data, have been carefully considered in the development of these amendments.

Paragraph S4.1(f) of the standard is amended to make it clear that a manufacturer may use bolts other than the specified bolts if the substituted bolts are equivalent.

The standard formerly required a Type 1 or Type 2 seatbelt assembly to be adjustable to fit an occupant with the weight and dimensions of a 95th-percentile adult male. To insure that belt assemblies can be adjusted to fit the range of occupants who may use them, paragraph S4.1(g) is amended to require each Type 1 or Type 2

seatbelt assembly to be adjustable to fit occupants whose weight and dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male. A belt assembly installed for an adjustable seat must conform to the requirements regardless of seat position. Several comments noted that no dimensions were specified in the notice for the various occupants which a belt assembly must fit. To remedy the problem, the standard provides a table of weights and dimensions for 5th-percentile adult females and 95th-percentile adult males.

In the notice, it was proposed to reduce the force required to release seat belt buckles from 30 to 22.5 pounds and to require that the release force for pushbutton-type buckles be applied no closer than 0.125 inch from the edge of the pushbutton access opening. In light of comments received, and other available information, the value of 30 pounds has been retained. The procedure for testing the buckle release force of a pushbutton-type buckle has been amended as proposed, however, to insure that the release force will not be applied so close to the edge of the access opening that the button might tilt in a manner unrepresentative of actual use conditions and thereby exaggerate the release force.

The buckle crush release requirements are amended to extend the standard's crush release requirements to all Type 1 and Type 2 seatbelt buckles, and to require application of the test load to areas of a buckle other than directly over the center of the release mechanism. Experience has indicated that non-pushbutton buckle release mechanisms are also subject to impairment when compressed, and occupants using such buckles are therefore provided equivalent protection by the extension of the buckle crush release require-



ments. In laboratory tests on pushbutton-type buckles, buckle release or malfunction occurred when a compressive force as low as 275 pounds was applied to a surface area other than the area directly over the pushbutton. The amended test will tend to eliminate buckle designs that are prone to accidental damage, or that release during the initial phase of the accident.

The notice proposed a new buckle latch test procedure in which a specified tensile load was to be applied at 30° to the buckle. In the light of comments received and other information that has become available indicating that the requirement was not justified, the procedure has not been adopted.

In response to comments that the acceleration levels proposed in the notice were too high, the acceleration level above which an emergency-locking retractor must lock has been reduced from 2g, as proposed, to 0.7g, and the acceleration level below which the retractor must not lock has been reduced from 1g to 0.3g. For reasons of occupant convenience, the notice proposed that the required upper limit on acceleration had to be met only when the webbing was extended to the length necessary to fit a 5th-percentile adult female. Upon review it has been determined that the proposed free travel distance could make a belt unsafe for use by a child, and,

further, that an adequate measure of convenience is provided by the requirement that a belt not lock at accelerations of less than 0.3g. Accordingly, the standard does not limit the belt withdrawal range within which the acceleration levels must be met. For similar reasons, the retraction force requirements are required to be met regardless of the amount of belt withdrawal.

As stated in the notice, the hex-bar abrasion test does not adequately simulate the type of webbing abrasion caused by some buckles. The standard as amended retains the hex-bar test, but supplements it with an additional abrasion requirement, under which webbing is required to retain at least 75 percent of its breaking strength after being repeatedly passed through the assembly buckle or manual adjustment device.

Effective date: September 1, 1971.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 209 in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . .

Issued on March 3, 1971.

Douglas W. Toms,  
Acting Administrator.

36 F.R. 4607  
March 10, 1971

## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209**

### **Seat Belt Assemblies for Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses**

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 209, in § 571.21 of Title 49, Code of Federal Regulations, to clarify the method in which the buckle release force of a Type 3 seat belt assembly is measured.

The standard provides (S4.3(d)(1), S5.2(d)(1)) that the force required to release a Type 3 assembly buckle is measured following the assembly test of S5.3, with a force of  $45 \pm 5$  pounds applied to a torso block restrained by the Type 3 assembly. The test procedure was intended to represent the situation in which the vehicle is inverted and the child is held by the harness. The force applied along the line of the belt is of primary significance, but it appears that the release force of some buckles is significantly increased by the pressure of the torso block on the back of the buckle. This pressure is not regarded as representative of actual conditions, in that the hard surface of the torso block offers much more resistance than would a child's body. To eliminate the effects of such pressure by the torso block, section S5.3(c)(1) of the standard is amended to read as set forth below.

Since this amendment is interpretative and clarifying in intent and imposes no additional

burden on any person, notice and public procedure thereon are unnecessary.

Effective date: April 1, 1971.

The major usage of Type 3 seat belt assembly buckles will be on child seating systems that comply with Standard No. 213, effective April 1, 1971. So that the amendment to Standard No. 209 will have maximum effect, good cause is found for establishing an effective date sooner than 180 days after issuance. Since the amendment is interpretative in nature and relieves a restriction, there is also good cause for establishing an effective date sooner than 30 days after issuance.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 209, in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . .

Issued on March 23, 1971.

Douglas W. Toms,  
Acting Administrator.

**36 F.R. 5973**  
**March 27, 1971**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209**  
**Seat Belt Assemblies in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses**  
**(Docket No. 69-23; Notice No. 3)**

**Reconsideration and Amendment**

The purpose of this notice is to respond to petitions filed pursuant to § 553.35 of Title 49, Code of Federal Regulations, requesting reconsideration of various amendments to Motor Vehicle Safety Standard No. 209, Seat Belt Assemblies, that were published March 10, 1971 (36 F.R. 4607). The petitions are granted in part and denied in part. Requests not expressly discussed in this notice should be considered denied.

1. One of the results of the March 10 amendments was that as of September 1, 1971, the standard would have become a vehicle standard as well as an equipment standard, *i.e.*, vehicles manufactured after the effective date would have had to have equipment conforming to the new requirements. The amendments relating to emergency-locking retractors are such, however, that with normal production tolerances it would be difficult to manufacture retractors that conform to the currently applicable requirements so that they would also conform to the post-September 1 requirements, and *vice-versa*. This creates an awkward situation, in which retractors supplied to vehicle manufacturers for use on September 1 would have to be made on September 1 and not before.

The vehicle aspect of the standard is therefore being deleted, and the date on which the amended requirements become mandatory is postponed to January 1, 1972, to coincide with the effective date of the new Standard No. 208. To allow for efficient changeover, manufacturers are permitted to manufacture belts to either the current or the amended requirements between September 1, 1971, and January 1, 1972.

2. With respect to the technical amendments to the attachment hardware requirements in

S4.1(f), American Safety Equipment Corporation requested that the reference to Standard No. 210 be omitted, so that anchorage nuts, plates, and washers would not have to be supplied if the vehicle has an anchorage that does not require them. The request has been found reasonable, and the standard is amended accordingly.

3. The National Highway Traffic Safety Administration has also evaluated requests by the American Safety Equipment Corporation concerning the range of occupants that a belt must adjust to fit, the test buckle release force test procedure, and the buckle crush resistance test procedure. The amended adjustment requirements (S4.1(g)(1) and (2)) specify more exactly the range of occupants that was intended by the original standard. The importance of having installed belts of proper length for the normal range of occupants outweighs, in the agency's judgment, the effort involved in ascertaining vehicle dimensions. The adjustment requirements are therefore not changed. With respect to the buckle test procedures, the petitioner's requests relating to the clarity of the buckle release procedure and to the need for an explanatory diagram to accompany the crush test are also denied. Although the buckle release test no longer refers to a method for testing lever action buckles, the method was little more than a suggestion and may in some cases have conflicted with the intent of the procedure that the force shall be applied so as to produce maximum releasing effect. The diagram requested to show the buckle crush procedure is not regarded as essential to understanding the procedure and has not been adopted.

4. Although no petition was received directly relating to the subject, the Swedish Trade Commission, on behalf of the Swedish manufactur-

ers, has expressed uncertainty as to how the crush test is to be applied to seat belt assemblies that have a buckle mounted on a rigid or semi-rigid bracket between the front seats. As described by the Commission, one design would tend to bend downwards under the pressure of the test device long before the required force of 400 pounds could be reached. In this case, the buckle will have to be supported from beneath, just as the conventional lap belt has to have some rigid backing in order to reach the 400-pound level. It is anticipated that if additional questions are raised concerning the method of force application to specific buckles, such questions can be answered through administrative interpretation.

5. Several petitions questioned the need to test a vehicle-sensitive emergency-locking retractor by accelerating it "in three directions normal to each other with its central axis oriented horizontally". The pendulum device used in most vehicle-sensitive retractors can sense lateral accelerations and sense the tilt of the vehicle, but it cannot readily sense upward or downward accelerations of the type required by the three-direction test when the retractor is oriented horizontally. It was suggested by Volvo that a retractor that locks when tilted to 35° in any direction should be exempt from the acceleration requirement. Volkswagen recommended accelerating the retractor in the horizontal plane in two directions normal to each other. On reconsideration, the National Highway Traffic Safety Administration has concluded that it is appropriate to relieve such a retractor from the vertical acceleration requirement when it is oriented horizontally and to establish an alternative to the requirement that it lock when accelerated in directions out of the horizontal plane, but that accelerations within the horizontal plane should continue to be required.

Accordingly, S5.2(j) is amended to require a vehicle-sensitive retractor to be accelerated in the horizontal plane in two directions normal to each other. During these accelerations, the retractor will be oriented at the angle in which it is installed in the vehicle. In addition, the retractor must either lock when accelerated in orientations out of the horizontal as prescribed in the March 10 rule or lock by gravity when

tilted in any direction to any angle greater than 45°.

6. One petitioner questioned the correctness of requiring webbing-sensitive retractors to be accelerated in the direction of webbing retraction, rather than in the direction of webbing withdrawal. The usage is necessary because under the test procedures of S5.2(j) it is the *retractor*, and not the webbing, that is accelerated. The acceleration must be in the direction that will reel the webbing out of the retractor—*i.e.*, the direction in which the webbing moves when retracting.

7. An additional question on retractor acceleration levels concerns the distance which a belt must be withdrawn in determining compliance with the requirement that the retractor shall not lock at 0.3g or less (S4.3(j)(ii)). The Hamill Manufacturing Company has requested an amendment to S4.3(j)(ii) to provide that the retractor shall not lock before the webbing extends a short distance at an acceleration of 0.3g. The National Highway Traffic Safety Administration recognizes that many retractors may be velocity-sensitive to some degree as well as acceleration-sensitive. Although a retractor that locks at too low a velocity would be an inconvenience, the NHTSA recognizes that an occupant does not ordinarily accelerate the belt after an initial pull and that the usual velocity involved in withdrawing the belt is low. On reconsideration, the NHTSA has therefore decided to amend S4.3(j)(ii) to provide that the retractor shall not lock before the webbing extends 2 inches at 0.3g.

8. Several petitioners pointed out that the requirements for retractor force specified in S4.3(j)(iii) and (iv) were not appropriate for systems in which a single length of webbing is used to provide both lap and shoulder restraint. In a typical installation of this sort, the webbing passes from a floor-mounted retractor up to a fitting on the B-pillar, then down across the shoulder to a slip joint on the buckle connector, and from there back across the lap to an out-board floor attachment. Although such a system may provide satisfactory restraint, it cannot simultaneously exceed a retractive force of 1.5 pounds on the lap belt and have a retractive

force on the shoulder belt of between 0.45 and 1.1 pounds, and it would therefore fail to conform to the standard as published March 10.

Upon reconsideration, the National Highway Traffic Safety Administration has decided to amend S4.3(j) by establishing retraction forces for 3-point systems that employ a single length of webbing. A new subsection (v) is added that requires such a system to have a retraction force falling within the range 0.45 pounds-1.50 pounds, and (iii) and (iv) are amended so that they do not apply to retractors in such systems. This range was suggested by Volkswagen, Volvo, and Klippan, and is considered to be a reasonable compromise between the need to provide complete retraction of the belt when not in use and

the need to limit the force so that it will not be uncomfortable to occupants.

*Effective date:* January 1, 1972, except that seat belt assemblies manufactured on or after September 1, 1971 and before January 1, 1972, may conform either to the current requirements of Standard No. 209 in 49 CFR 571.21 or to the requirements of Standard No. 209 as amended by this notice and the notice of March 10, 1971 (36 F.R. 4607).

Issued on August 26, 1971.

Charles H. Hartman  
Acting Administrator

36 F.R. 17430  
August 31, 1971





# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

## Seat Belt Assemblies

(Docket No. 73-16; Notice 2)

The purpose of this notice is to amend certain requirements of Motor Vehicle Safety Standard No. 209 (49 CFR 571.209), *Seat belt assemblies*, relating to the width of belt webbing and to the performance of seat belt retractors. The amendments were proposed in a notice published June 20, 1973 (38 FR 16084).

In the June 20 notice, the agency proposed to allow the width of those portions of a combination lap and shoulder belt that do not touch the occupant to be less than the 1.8 inches formerly required by the standard. The Chrysler Corporation, in its comment, suggested that narrower webbing should also be permitted for the type of lap belt that is used by itself. The agency agrees that a lap belt in combination with a shoulder belt (known as Type 2 assembly) is indistinguishable from an independent lap belt (Type 1 assembly), as far as the width of its webbing is concerned, and is therefore amending the standard to permit narrower webbing for non-contact portions of Type 1 belts as well as Type 2 belts.

Chrysler also requested narrower webbing for non-contact portions of children's harnesses (Type 3 assemblies). In view of the close-fitting design of Type 3 assemblies, the agency has not found a benefit to be gained from the use of narrower webbing in the few areas of non-contact. The Type 3 requirements are not being amended at this time. The American Safety Equipment Corporation requested that the contactability of the webbing with occupants be determined with a range of occupants. The agency remains persuaded that the use of a 95th percentile adult male occupant will be sufficient to insure that the narrower webbing will not touch any occupant who uses the seat. The

agency therefore declines to adopt American Safety's suggestion.

The proposed amendment of the emergency-locking retractor requirements of S4.3 drew several comments, not all of them relating to the parts of S4.3 that were proposed to be changed. Mercedes Benz requested revision of the requirement of S4.3(j)(2) that the retractor must not lock before the webbing extends 2 inches under an acceleration of 0.3g or less. The 0.3g requirement had been carried over without change from the previous version of S4.3 and was thought to be a reasonable means of preventing retractors from being inconveniently sensitive. The NHTSA does not find sufficient cause at this time to alter its conclusion concerning the most appropriate minimum level and is therefore retaining the minimum level of 0.3g.

A second issue raised by Mercedes Benz concerns the treatment under section S4.3(j) of a retractor having both vehicle sensitive and webbing sensitive features. It has been the NHTSA's position that with respect to the maximum permissible locking level, a dual-action retractor would conform if it met either of the applicable requirements. Thus, a dual-action retractor whose webbing-sensitive mechanism locks within 1 inch at an acceleration of 0.7g will conform, even though its vehicle-sensitive mechanism is not capable of locking at its required level. With respect to the minimum locking level, however, different considerations apply. The agency's intent in providing a minimum level below which the retractor must not lock is to enhance the convenience of the system. The webbing-sensitive mechanism that locks below 0.3g would be no less inconvenient if coupled with a vehicle sensitive mechanism than it would

be if used by itself. The agency has therefore concluded that a dual-action retractor may conform to the maximum locking acceleration level of 0.7g (S4.3(j)(1)) with either mechanism, but that it must conform to both minimum locking level requirements (S4.3(j)(2) and (3)).

The tilt angle of 17° proposed as the minimum locking level for vehicle sensitive retractors was stated by several comments to be too high. Although there was general agreement as to the advisability of using a tilt test rather than an acceleration test, lower tilt angles were suggested, ranging downward to 11°. After considering the comments, the NHTSA has concluded that a moderate downward revision to 15° will prevent retractor lockup in normal road operation and has adopted that angle in S4.3(j)(3). The suggestion by Ford and American Motors that the "retractor drum's central axis" may be difficult to determine in complicated mechanisms has been found to have merit and the requirement as adopted refers to the orientation at which the retractor is installed in the vehicle.

The proposed revisions to the minimum retraction force requirements for retractors attached to upper torso restraints encountered several objections, the principal one being that no one was certain about the meaning of the proposed requirement that the retractor should "retract the webbing fully." The quoted language had been proposed in response to a petition by General Motors requesting amendment of the requirement that the retractor exert a retractive force of not less than 0.45 pound. The GM petition had requested a force of 0.2 pound, but the agency's initial intent, as reflected in the notice, was to grant a potentially greater relief by deleting reference to a specific minimum force. It appears from the confusion in the comments that a contrary result might be produced in some cases, and the agency has therefore concluded that a simple reduction in the force level to the level requested by GM is the least complicated and most readily enforceable means of lowering the minimum force level. The suggestion by Ford, that the ability to retract is implicit in the definition of retractor and that no

minimum force level is required, has some merit, but the agency prefers to retain a measurable minimum level.

There were several questions of interpretation concerning the point at which the retraction force is to be measured. The test procedures of S5.2 provide that the webbing is to be fully extended, passing over any hardware or other material specified for use with the webbing, and that it is then to be retracted and the retraction force measured as the lowest force within plus or minus 2 inches of 75 percent extension. The procedure is intended to measure the ability of the retractor to retract the webbing as installed in the vehicle, and the point of measurement most consistent with this intent is the most distant point of the webbing from the retractor. The NHTSA intends to conduct its measurements in this fashion.

The proposed amendment to S5.2 that would amend the test procedures to reflect the limitation of the 0.3g acceleration level to webbing-sensitive retractors was not objected to and is adopted as proposed.

In consideration of the foregoing, S4.2(a), S4.3(j), and S5.2(j) of Motor Vehicle Safety Standard No. 209, 49 CFR § 571.209, are amended. . . .

Effective date: August 28, 1973. The NHTSA finds it desirable to allow manufacturers to produce seat belt assemblies under the requirements as hereby amended (which generally are relaxed relative to previous requirements) prior to the effective date of the next phase of Standard No. 208 (49 CFR 571.208). It is therefore found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 23, 1973.

James B. Gregory  
Administrator

38 F.R. 22958  
August 28, 1973



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 209

### Seat Belt Assemblies

(Docket No. 73-16; Notice 4)

This notice amends Standard No. 209, *Seat belt assemblies*, 49 CFR 571.209, to reduce the minimum retraction force required of emergency-locking retractors attached to lap belts from 1.5 pounds to 0.6 pounds. This amendment to S4.3(j)(4) responds to a rulemaking petition submitted by Toyo Kogyo.

A notice of proposed rulemaking published October 2, 1973 (38 F.R. 27303), proposed the modification because the 1.5-pound force could prove excessive for occupant comfort, and experience with the 0.6-pound level in automatic-locking retractors has been satisfactory. Their performance at 0.6 pounds does not support an assertion in one comment to the docket that degradation of the retractor elements over time would result in almost total loss of retractive force. All other comments to the docket were favorable.

In consideration of the foregoing, S4.3(j)(4) of Motor Vehicle Safety Standard No. 209, *Seat belt assemblies*, 49 CFR 571.209, is amended. . .

*Effective date:* January 24, 1974. Because the amendment relaxes a requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 18, 1974.

James B. Gregory  
Administrator

39 F.R. 2771

January 24, 1974



# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 209**

## **Seat Belt Assemblies**

**(Docket No. 74-9; Notice 7)**

**ACTION:** Final rule; response to petitions for reconsideration.

**SUMMARY:** This notice responds to five petitions for reconsideration and petitions for rulemaking concerning Standard No. 213, *Child Restraint Systems*. In response to the petitions, the agency is changing the labeling requirements to permit the use of alternative language, modifying the minimum radius of curvature requirement for restraint system surfaces and extending the effective date of the standard from June 1, 1980, to January 1, 1981. In addition, several typographical errors are corrected in Standard No. 209, *Seat Belt Assemblies*.

**DATES:** The amendments are effective on May 1, 1980. The effective date of the standard is changed from June 1, 1980, to January 1, 1981.

**FOR FURTHER INFORMATION CONTACT:** Mr. Vladislav Radovich, Office of Vehicle Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264).

**SUPPLEMENTARY INFORMATION:** On December 13, 1979 (44 F.R. 72131) NHTSA published in the *Federal Register* a final rule establishing Standard No. 213, *Child Restraint Systems*, and making certain amendments to Standard No. 209, *Seat Belt Assemblies and Anchorages*. Subsequently, petitions for reconsideration were timely filed with the agency by Cosco, General Motors, Juvenile Products Manufacturers Association (JPMA), and Strolee. Subsequent to the time for filing petitions for reconsideration, Strolee also filed a petition for rulemaking to amend the standard. After evaluating

the petitions, the agency has decided to modify, as fully explained below, some of the requirements of Standard No. 213. All other requests for modifications are denied. The agency is also correcting several minor typographical errors in the text of Standard No. 209.

### **Labeling**

Standard No. 213 requires manufacturers to place a permanently mounted label on the restraint to encourage its proper use. General Motors (GM) petitioned for reconsideration of three of the labeling requirements.

Section S5.5.2(f) of the standard requires each child restraint to be labeled with the size and weight ranges of children capable of using the restraint. In its petition, GM said that the requirement could "unnecessarily preclude some children from using the restraint or suggest use by children too large for the restraint." GM also commented that some infant restraints are intended to be used from birth and thus the lower size and weight limitation serves no purpose.

In addition, GM said that stating the upper size limit for infant restraints in terms of seated height rather than in standing height is a more appropriate way to set size limitations for infants. For example, GM said that an infant with a short torso and long legs might be precluded from using the restraint if the limitation is stated in terms of standing height, while an infant with short legs and a torso too long for the restraint would be inappropriately included among ones who could supposedly use the restraint. GM requested that infant restraints be allowed to be labeled with an optional statement limiting use by upper weight and seated height.



NHTSA agrees that specifying a lower weight and size limit is unnecessary for an infant carrier designed to be used from birth and has amended the standard accordingly. The agency has decided not to adopt GM's proposal to state the upper size limit in seating rather than standing height. The purpose of the label is to provide important instructions and warnings in as simple and understandable terms as possible. Standing height, rather than seating height, is a measurement parents are familiar with and which is commonly measured during pediatric examinations. As GM pointed out, it is possible to establish a limit based on standing height which would exclude any infant whose seating height is too high to properly use the restraint. Therefore, the agency will continue to require the upper size limit to be stated in terms of standing height.

GM also requested that manufacturers be allowed to establish a lower usage limit for restraints used for older children based on the child's ability to sit upright rather than on his or her size and weight. GM said the lower limit "is not as dependent upon the child's size as it is on the child's ability to hold its head up (sit upright) by itself. This important capability is achieved at a wide range of child sizes." NHTSA agrees that the type of label GM proposes can clearly inform parents on which children can safely use a restraint and therefore will permit use of such a label.

Section S5.5.2(g) of the standard requires the use of the word "Warning" preceding the statement that failure to follow the manufacturer's instructions can lead to injury to a child. GM requested that the word "Caution" be permitted as an alternative to "Warning." GM said that since 1975 it has used caution in its labels and owners' and service manuals as a lead or signal word where the message conveys instructions to prevent possible personal injury. GM said that the words caution and warning are generally accepted as synonymous.

The agency believes that the word "Warning," when used in its ordinary dictionary sense, is a stronger term that conveys a greater sense of danger than the word "Caution" and thus will emphasize the importance of following the specified instructions. Therefore, the agency will continue to require the use of the word "Warning."

Section S5.5.2(k) of the standard requires restraints to be labeled that they are to be used in a

rear-facing position when used with an infant. GM said that while the requirement is appropriate for so-called convertible child restraints (restraints that can be used by infants in a rear-facing position and by children in a forward-facing position), it is potentially misleading when used with a restraint designed exclusively for infants. GM said the current label might imply that the restraints can be used in forward-facing positions with children. GM recommended that restraints designed only for infants be permitted to have the statement, "Place this infant restraint in a rear-facing position when using it in the vehicle." The agency's purpose for establishing the labeling requirement was to preclude the apparent widespread misuse of restraints designed for infants in a forward-facing rather than rear-facing position. Since GM's recommended label will accomplish that goal, the agency is amending the standard to permit its use.

#### **Radius of Curvature**

Section S5.2.2.1(c) of the standard requires surfaces designed to restrain the forward movement of a child's torso to be flat or convex with a radius of curvature of the underlying structure of not less than 3 inches. Ford Motor Co. objected to the 3-inch limitation on radius of curvature arguing that measuring the radius of curvature of the underlying structure would eliminate designs that have not produced serious injuries in actual crashes. Ford said the shield of its Tot-Guard has a radius of curvature from 2.2 to 2.3 inches and it had no evidence of serious injury being caused by the shield when the restraint has been properly used.

The purpose of the radius of curvature requirement was to prohibit the use of surfaces that might concentrate impact forces on vulnerable portions of a child's body. It was not the agency's intent to prohibit existing designs, such as the Tot-Guard, which have not produced injuries in actual crashes. Since a 2-inch radius of curvature should therefore not produce injury the agency has decided to change the radius of curvature requirement from 3 to 2 inches.

Although the standard sets a minimum radius of curvature for surfaces designed to restrain the forward movement of a child, it does not set a minimum surface area for that surface. Prototypes of new restraints shown to the agency by some manufacturers indicate that they are voluntarily incorporating sufficient surface areas in their

designs. The agency encourages all manufacturers to use surface areas at least equivalent to those of the designs used by today's better restraints.

### **Occupant Excursion**

Section S5.1.3.1 of the standard sets a limit on the amount of knee excursion experienced by the test dummy during the simulated crash tests. It specifies that "at the time of maximum knee forward excursion the forward rotation of the dummy's torso from the dummy's initial seating configuration shall be at least 15° measured in the sagittal plane along the line connecting the shoulder and hip pivot points."

Ford Motor Co. objected to the requirements that the dummy's torso rotate at least 15 degrees. Ford said that it is impossible to measure the 15 degree angle on restraints such as the Tot-Guard since the test dummy "folds around the shield in such a manner that there is no 'line' from the shoulder to the hip point." In addition, restraints, such as the Tot-Guard, that enclose the lower torso of the child can conceal the test dummy hip pivot point.

The agency established the knee excursion and torso rotation requirements to prevent manufacturers from controlling the amount of test dummy head excursion by allowing the test dummy to submerge excessively during a crash (i.e., allowing the test dummy to slide too far downward underneath the lap belt and forward, legs first). A review of the agency's testing of child restraints shows that current designs that comply with the knee excursion limit do not allow submarining. Since the knee excursion limit apparently will provide sufficient protection to prevent submarining, the agency has decided to drop the torso rotation requirement. If future testing discloses any problems with submarining, the agency will act to establish a new torso rotation requirement as an additional safeguard.

### **Head Impact Protection**

Section S5.2.3 requires that each child restraint designed for use by children under 20 pounds have energy-absorbing material covering "each system surface which is contactable by the dummy head." Strolee petitioned the agency to amend this requirement because it would prohibit the use of unpadded grommets in the child restraint. Strolee explained that some "manufacturers use grom-

mets to support the fabric portions of a car seat where the shoulder belt and lap belt penetrate the upholstery. These grommets retain the fabric in place and give needed support where the strap comes through to the front of the unit." Because of the use of the grommets in positioning the energy-absorbing padding and belts, the agency does not want to prohibit their use. However, to ensure that use of the grommets will not compromise the head impact protection for the child, the agency will only allow grommets or other structures that comply with the protrusion limitations specified in section S5.2.4. That section prohibits protrusions that are more than  $\frac{2}{3}$  of an inch high and have a radius of less than  $\frac{1}{4}$  inch. Because this amendment makes a minor change in the standard to relieve a restriction, prior notice and a comment period are deemed unnecessary.

### **Belt Requirements**

Strolee petitioned the agency to amend the requirement that all of the belts used in the child restraint system must be 1½ inches in width. Strolee said that straps used in some restraints to position the upper torso restraints have "snaps" so that the parent may release this positioning belt conveniently." Strolee argued that such straps should be exempt from the belt width requirement since "the snap would release far before any loads could be experienced."

The agency still believes that any belt that comes into contact with the child should be of a minimum width so as not to concentrate forces on a limited area of the child. This requirement would reduce the possibility of injury in instances where the snap on a positioning strap failed to open. Strolee's petition is therefore denied.

Strolee has also raised a question about the interpretation of section S5.4.3.3 on belt systems. Strolee asked whether the section requires a manufacturer to provide both upper torso belts, a lap belt and a crotch strap or whether a manufacturer can use a "hybrid" system which uses upper torso belts, a shield, in place of a lap belt, and a crotch strap. The agency's intent was to allow the use of hybrid systems. The agency established the minimum radius of curvature requirements of section S5.2.2.1(c) to ensure that any shield used in place of a lap or other belt would not concentrate forces on a limited area of the child's body. NHTSA has amended section S5.4.3.3 to clarify



the agency's intent. Because this is an interpretative amendment, which imposes no new restrictions, prior notice and a comment period are deemed unnecessary.

### **Height Requirements**

Strolee asked the agency to reconsider the requirements for seat back surface heights set in section S5.2.1.1. Strolee argued that the higher seat back required by the standard would restrict the driver's rear vision when the child restraint is placed in the rear seat.

The final rule established a new seat back height requirement for restraints recommended for use by children that weigh more than 40 pounds. To provide sufficient protection for those children's heads, the agency required the seat back height to be 22 inches. The agency explained that the 22-inch requirement was based on anthropometric data showing that the seating height of children weighing 40 or more pounds can exceed 23 inches. The agency still believes that 22-inch requirement is necessary for the protection of the largest child for which the restraint is recommended. NHTSA notes that child restraints can be designed to accommodate the higher seat backs without allowing the overall height of the child restraint to unduly hinder the driver's vision.

### **Padding**

In its petition, JPMA claimed that the standard "calls for the application of outdated specifications" for determining the performance of child restraint padding in a 25-percent compression-deflection test. A review of the most recent edition of the American Society for Testing and Materials (ASTM) handbook shows that the compression-deflection test in two of the three ASTM standards referenced by the agency has not changed. The third standard (ASTM D1565) referenced by the agency has been replaced. However, the replacement standard does not contain a 25 percent compression-deflection test. Therefore, the agency will continue to use the three ASTM standards referenced in the December 1979 final rule.

### **Effective Date**

Cosco, Strolee, and the Juvenile Products Manufacturers Association (JPMA) petitioned the

agency for an extension of the June 1, 1980, effective date. They requested that the effective date be changed to at least January 1, 1981, and Strolee requested a delay until March 1, 1981. They argued that the June 1, 1980, effective date does not allow manufacturers sufficient time to develop, test and tool new child restraints.

Testing done for the agency has shown that many of the better child restraint systems currently on the market can meet the injury criteria and occupant excursion limitation set by the standard. Some of those seats would need changes in their labeling, removal of arm rests and new belt buckles and padding to meet the standard. Such relatively minor changes can be made in the time available before the June 1, 1980, effective date.

Several manufacturers have informed the agency that they are designing new restraints to meet the standard. Based on prototypes of those restraints shown to the agency, NHTSA believes that these new restraints may be more convenient to use, less susceptible to misuse and provide a higher overall level of protection than current restraints. Based on leadtime information provided by individual manufacturers and the JPMA, the agency concludes that extending the standard from June 1, 1980, to January 1, 1981, will provide sufficient leadtime. Providing a year's leadtime is in agreement with the leadtime estimates provided by the manufacturers as to the time necessary for design and testing, tooling and buckle redesign.

### **Compatibility With Vehicle Belts**

On December 12, 1979, NHTSA held a public meeting on child transportation safety. At that meeting, several participants commented about the difficulty, and in some cases the impossibility, of securing some child restraint systems with a vehicle lap belt because the belt will not go around the restraint. Testing done by the agency during the development of the recently proposed comfort and convenience rulemaking also confirms that problem. The agency reminds child restraint manufacturers that Standard No. 213, *Child Restraint Systems*, requires all child restraints to be capable of being restrained by a vehicle lap belt.

### **Corrections**

In the final rule published on Standard No. 209, *Seat Belt Assemblies*, there were a number of



typographical errors, such as listing the lower chest circumference of the 5 percentile female as 36.6 inches rather than the correct figure of 26.6 inches. Those errors have been corrected.

In addition, the final rules for Standards No. 209 and No. 213 inadvertently did not include a requirement on belt resistance to buckle abrasion. The notice of proposed rulemaking for both standards included the belt buckle abrasion requirements, which were not opposed by any of the com-

menters. The standards have therefore been amended to include that requirement.

The principal authors of this notice are Vladislav Radovich, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on April 23, 1980.

Joan Claybrook  
*Administrator*  
**45 F.R. 29045**  
**May 1, 1980**



# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 209**

## **Seat Belt Assemblies**

**(Docket No. 80-12; Notice 2)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends Safety Standard No. 209, *Seat Belt Assemblies*, to exempt seat belts installed in conjunction with automatic restraint systems from the belt elongation requirements of the standard. This amendment is based on a petition for rulemaking submitted by Mercedes-Benz of North America and follows the publication of a proposal. The amendment permits manufacturers to install belt systems incorporating load-limiting devices which are intended to make further reductions in head and upper torso injuries during an accident. Some load-limiting belt systems utilize webbing that elongates more than is currently allowed by Standard No. 209. This amendment would permit this and other type systems to exceed the maximum elongation allowed by the standard.

**DATES:** This amendment is effective January 12, 1981.

**ADDRESSES:** Any petition for reconsideration should refer to the docket number and notice number and be submitted to: National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:** Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2264).

**SUPPLEMENTARY INFORMATION:** Safety Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), specifies performance requirements for seat belts to be used in motor vehicles. One of these performance requirements specifies the maximum

amount that the webbing of a belt assembly is permitted to extend or elongate when subjected to certain specified forces (paragraph S4.2(c)). Mercedes-Benz of North America petitioned NHTSA to exempt seat belt assemblies installed in passenger cars in conjunction with air cushion restraint systems from the webbing elongation requirements of the standard. The agency granted that petition and issued a notice of proposed rulemaking to amend the standard on August 4, 1980 (45 F.R. 51626).

Mercedes is considering the use of a belt system that incorporates a load-limiting device. A load-limiter is a seat belt assembly component or feature that controls tension on the seat belt and modulates or limits the force loads that are imparted to a restrained vehicle occupant by the belt assembly during a crash. Load-limiting devices are intended to reduce head and upper torso injuries through increased energy management. A load-limiter can be a separate component of the seat belt system, such as a torsion bar that allows the retractor to reel out additional webbing when a certain designed force level is reached. The load-limiter can also be a feature of the webbing itself, such as webbing that will elongate to certain designed lengths when subjected to particular force levels. Mercedes is interested in using the latter type load-limiting system. However, the webbing in the Mercedes belt system would elongate beyond the limits that are currently specified in Standard No. 209. Mercedes' petition stated that this type belt system should be allowed in vehicles equipped with air cushion restraints since the two systems used in conjunction with one another can be designed to achieve the maximum reduction in head injuries and upper-torso injuries.



Although safety belts protect occupants from life-threatening impacts with the vehicle interior, the forces necessarily generated by the belts upon occupants during a crash can result in upper torso injury. As noted in the notice of proposed rulemaking, data available to the agency indicate that load-limiting belts can reduce these injuries, as well as working in combination with an automatic restraint system to provide protection for impacts with the vehicle interior. The proposal specified that both Type 1 (lap belts) and Type 2 (combination lap and shoulder belts) manual belts having load-limiting devices and used in conjunction with automatic restraints would be exempted from the elongation requirements. Additionally, the proposal specified that such belts would have to be labeled to clarify that they are intended for use only in vehicles equipped with automatic restraint systems.

The proposal limited the use of load-limiting belts to vehicles equipped with automatic restraints since there are currently no dynamic performance requirements or injury criteria for manual belt systems used alone. There are no requirements to ensure that a load-limiting belt system would protect vehicle occupants from impacting the steering wheel, instrument panel and windshield, which would be very likely if the belts elongated beyond the limits specified in Standard No. 209. Therefore, the elongation requirements are necessary to ensure that manual belts used as the sole restraint system will adequately restrain vehicle occupants.

Nine comments were submitted in response to the August 4 proposal, all supporting the exemption for load-limiting belts. Vehicle manufacturers stated that the proposed exemption from the elongation requirements would allow design flexibility and lead to improved occupant restraint systems.

American Motors Corporation (AMC) stated that the exemption for load-limiting belts should only apply to Type 2 manual belts. The company argued that the only available data relates to the ability of Type 2 load-limiting belts to reduce certain head and upper-torso injuries. AMC stated that torso injury is not a function of lap belt loads and that no similar correlation has been made between lap belt loads and pelvic fractures. Therefore, the company believes that the exemption from the elongation re-

quirements for Type 1 belts should be postponed until specific injury patterns can be correlated with lap belt loads.

The agency proposed allowing the exemption for both Type 1 and Type 2 belts in order to give manufacturers broader design latitude to use load-limiting features on all belt systems used in conjunction with automatic restraints. AMC is correct in its statement that more data are available regarding the correlation between Type 2 belts and upper-torso injury than is available regarding load-limiting features on Type 1 belts. However, comments received from Rolls-Royce Motors stated that the company has tested manual Type 1 belts incorporating load-limiting features and found that better results are obtained under the injury criteria of Safety Standard No. 208 (49 CFR 571.208) than with Type 1 belts which must comply with the elongation requirements. In light of this information, and the fact that load-limiting Type 1 belts would only be allowed in conjunction with automatic restraint systems complying with the injury criteria of Standard No. 208, the agency has decided to include Type 1 belts in the exemption. This will allow manufacturers to develop innovative designs to maximize the protection provided by its automatic restraint systems. If future data indicate a problem with Type 1 belts that incorporate load-limiting features, the exemption from the elongation requirements can be reconsidered by the agency.

The August 4, 1980, notice proposed to add a new definition to Standard No. 209 to define "load-limiter," and limited the exemption from the elongation requirements to belts incorporating load-limiters and installed in conjunction with automatic restraints. Volvo of America Corporation commented that the definition of "load-limiter" is very broad and could be interpreted to include all existing belt webbing. Volvo stated that the exemption should, therefore, apply to any Type 1 or 2 belt installed in conjunction with an automatic restraint, and not be limited to load-limiting belts.

While the agency understands Volvo's point that the proposed language may be extremely detailed, we believe the language is necessary to clarify the exemption and to avoid confusion for belt manufacturers. Safety Standard No. 209 is an equipment standard rather than a vehicle standard, and each

seat belt assembly must be certified by the belt manufacturer. The proposed language was intended to create a clear distinction between belts complying with elongation requirements of Safety Standard No. 209 and those that incorporate load-limiting features that preclude compliance with the elongation requirements. The proposed language explained which belt systems must be labeled as being for use only in vehicles equipped with automatic restraints. The agency believes this language, including the definition of "load-limiter," is necessary at the current time to clarify the requirements for those persons or manufacturers who may not be totally familiar with the requirements of Safety Standard No. 209. Otherwise, it would not be clear from the standard why certain belts are exempted from the elongation requirements of the standard.

In another comment related to this same subject, General Motors Corporation pointed out that the proposed labeling requirement for load-limiting belts could apply to all Type 1 and 2 belts incorporating load-limiting features even if all current 209 requirements are met. General Motors stated that load-limiting belt systems that can, nevertheless, comply with the elongation requirements of the standard should not be limited in their application to vehicles equipped with automatic restraint systems. The agency agrees with this argument, and the language is changed in this amendment accordingly.

General Motors also questioned the need to require any label at all on load-limiting belts. The proposal specified that such belts would have to be permanently marked or labeled to indicate the assembly may only be installed in vehicles in conjunction with an automatic restraint system. General Motors argued that a label is not necessary to control the installation of load-limiting belts in the proper vehicles. Seat belt manufacturers must currently provide appropriate installation instructions for its equipment. General Motors contends that this requirement, coupled with the fact that replacement belts are generally ordered and installed by a repair facility, will ensure that load-limiting belts are only installed in vehicles equipped with automatic restraints. The agency does not agree with this position. As stated earlier, the agency believes that care must be taken to distinguish load-limiting belt systems from other systems. If there is a label on the belt

itself, a person making the installation will be aware that the belt should only be installed in conjunction with automatic restraints. This should be made obvious to the person making the installation without reference to the installation instructions. Further, none of the other commenters objected to the proposed labeling requirement. American Motors Corporation specifically stated that a label is necessary.

General Motors is correct in its statement that this warning will also be provided in the installation instructions provided by the belt manufacturer. Paragraphs S4.1(1) of Safety Standard No. 209 provides, in part, that the installation instruction sheet provided by the belt manufacturer shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles. Therefore, belt manufacturers will be required to specify in the installation instructions that load-limiting belts are only to be installed in combination with automatic restraint systems. The agency believes that at the current time these duplicative warnings, in the instruction sheet and on a belt label, are a necessary precaution to ensure that load-limiting belts are only installed in the proper vehicles. After a majority of vehicles on the road are equipped with automatic restraints, such labeling may no longer be necessary.

Volvo of America Corporation commented that some upper limit on belt elongation may be required for Type 1 manual belts incorporating load-limiting features, although no such limit was specified in the proposal. Volvo pointed out that Type 1 belts installed in conjunction with air cushion restraints will also provide roll-over protection for vehicle occupants. The company is concerned that if no upper limit on elongation is specified, such belts may not provide the intended protection in roll-over accidents.

While the agency agrees that this is a legitimate concern, it does not believe it is necessary to specify such an upper limit at the current time. It is not likely that manufacturers will design load-limiting belt systems that will elongate appreciably beyond the limits specified in Standard No. 209. Presumably, load-limiting belts will be designed to provide actual restraint in conjunction with the automatic restraint system, if the vehicle is to comply with the injury criteria of Safety Standard No.



208. If a load-limiting belt design elongates to the extent that it would provide no protection in roll-over accidents, it would also not provide any protection in frontal crashes. Therefore, it is not likely that manufacturers would permit such extensive elongation in their systems. Moreover, the forces generated in frontal crashes are more severe than those that occur in roll-over accidents, so the elongation that would occur even with load-limiting systems would not be as great in roll-over accidents as in frontal accidents. The agency believes that manufacturers should be given broad latitude in the development of load-limiting belt systems to be used in vehicles equipped with automatic restraints. In light of these considerations, no upper limit on belt elongation is specified in this amendment. Manufacturers should be cognizant of the point made by Volvo, however, during the development of their systems.

The comments of Renault USA included general questions regarding automatic seat belts and the relationship between Safety Standard No. 208 and Safety Standard No. 209. Some confusion apparently exists regarding paragraph S4.5.3.4 of Safety Standard No. 208 and agency interpretations regarding that paragraph. The agency has stated in the past that only automatic belts that are installed to meet the frontal crash protection requirements of S5.1 of Standard No. 208 are exempted from the requirements of Standard No. 209. Yet, the agency has also stated that those portions of Standard No. 209 relating to retractors are applicable to all automatic belts. Renault finds these statements inconsistent.

Paragraph S4.5.3.4 of Standard No. 208 is a general provision which exempts certain automatic belts, those meeting the injury criteria of the standard, from the requirements of Standard No. 209. However, paragraph S4.5.3.3(a) of Standard No. 208 specifically provides that automatic belts shall conform to S7.1 of Standard No. 208, and that paragraph relates to the performance requirements for belt retractors specified in Standard No. 209. It is for this reason that the agency has stated that all automatic belts must comply with the retractor requirements, notwithstanding the general exemption specified in S4.5.3.4.

Renault contends that paragraph S4.5.3.4 is also inconsistent by its own terms since, Renault states, an automatic belt system must always comply with the injury criteria of S5.1 of Standard No. 208. This incorrect Paragraph S4.5.3 of Safety Standard No. 208 specifies that an automatic belt

may be used to meet the crash protection requirements of any option under S4 and in place of any seat belt assembly otherwise required by that option. Therefore, prior to the effective date of the automatic restraint requirements of the standard, automatic belts could be used to satisfy the third option of section S4—the seat belt option. Automatic belts installed under the third option would not be required to comply with the injury criteria of S5.1, since the injury criteria is only specified as a requirement under option 1 and option 2. Manufacturers are permitted, however, to install automatic belts in satisfaction of either option 1 or option 2 and to certify to the injury criteria, if they desire. In summary, automatic belts installed in passenger cars in compliance with the injury criteria of Safety Standard No. 208 are only required to comply with the provisions of Safety Standard No. 209 relating to retractors. They are not required to comply with any other provision in Standard No. 209. Automatic belts installed in passenger cars that are not certified as being in compliance with the injury criteria of Standard No. 208, i.e., those installed under the third option of the standard, are required to comply with all provisions of Standard No. 209. Manual seat belts having load-limiters, installed in vehicles in conjunction with automatic restraints meeting the injury criteria of Standard No. 208, are required to comply with all provisions of Standard No. 209 except the elongation requirements (by this amendment).

The agency has determined that this amendment is not a significant regulation under Executive Order 12221, "Improving Government Regulations," and the Departmental guidelines implementing that Order. Therefore, a regulatory analysis is not required. The exemption specified in this amendment provides manufacturers with broader design alternatives and should have little if any economic or environmental impact. Consequently, the agency has also determined that a regulatory evaluation is not required.

The engineer and lawyer primarily responsible for the development of this rule are William Smith and Hugh Oates, respectively.

Issued on January 5, 1981.

Joan Claybrook  
*Administrator*  
46 F.R. 2618  
January 12, 1981



## MOTOR VEHICLE SAFETY STANDARD NO. 209

### Seat Belt Assemblies

(Docket No. 69-23)

#### S1. Purpose and Scope.

This standard specifies requirements for seat belt assemblies.

#### S2. Application.

This standard applies to seat belt assemblies for use in passenger cars, multipurpose passenger vehicles, trucks, and buses.

#### S3. Definitions.

“Adjustment hardware” means any or all hardware designed for adjusting the size of a seat belt assembly to fit the user, including such hardware that may be integral with a buckle, attachment hardware, or retractor.

“Attachment hardware” means any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle.

“Automatic-locking retractor” means a retractor incorporating adjustment hardware by means of a positive self-locking mechanism which is capable when locked of withstanding restraint forces.

“Buckle” means a quick release connector which fastens a person in a seat belt assembly.

“Emergency-locking retractor” means a retractor incorporating adjustment hardware by means of a locking mechanism that is activated by vehicle acceleration, webbing movement relative to the vehicle, or other automatic action during an emergency and is capable when locked of withstanding restraint forces.

“Hardware” means any metal or rigid plastic part of a seat belt assembly.

“Load-limiter” means a seat belt assembly component or feature that controls tension on the seat belt to modulate the forces that are imparted to occupants restrained by the belt assembly during a crash.

“Nonlocking retractor” means a retractor from which the webbing is extended to essentially its full length by a small external force, which provides no adjustment for assembly length, and which may or may not be capable of sustaining restraint forces at maximum webbing extension.

“Pelvic restraint” means a seat belt assembly or portion thereof intended to restrain movement of the pelvis.

“Retractor” means a device for storing part or all of the webbing in a seat belt assembly.

“Seat back retainer” means the portion of some seat belt assemblies designed to restrict forward movement of a seat back.

“Seat belt assembly” means any strap, webbing, or similar device designed to secure a person in a motor vehicle in order to mitigate the results of any accident, including all necessary buckles and other fasteners, and all hardware designed for installing such seat belt assembly in a motor vehicle.

“Strap” means a narrow non-woven material used in a seat belt assembly in place of webbing.

“Type 1 seat belt assembly” is a lap belt for pelvic restraint.

“Type 2 seat belt assembly” is a combination of pelvic and upper-torso restraints.

“Type 2a shoulder belt” is an upper-torso restraint for use only in conjunction with a lap belt as a Type 2 seat belt assembly.

“Upper torso restraint” means a portion of a seat belt assembly intended to restrain movement of the chest and shoulder regions.

“Webbing” means a narrow fabric woven with continuous filling yarns and finished selvages.

#### S4. Requirements.

**S4.1 (a) *Single occupancy.*** A seat belt assembly shall be designed for use by one, and only one, person at any one time.

**(b) *Pelvic restraint.*** A seat belt assembly shall provide pelvic restraint whether or not upper torso

restraint is provided, and the pelvic restraint shall be designed to remain on the pelvis under all conditions, including collision or roll-over of the motor vehicle. Pelvic restraint of a Type 2 seat belt assembly that can be used without upper torso restraint shall comply with requirements for Type 1 seat belt assembly in S4.1 to S4.4.

(c) *Upper torso restraint.* A Type 2 seat belt assembly shall provide upper-torso restraint without shifting the pelvic restraint into the abdominal region. An upper-torso restraint shall be designed to minimize vertical forces on the shoulders and spine. Hardware for upper-torso restraint shall be so designed and located in the seat belt assembly that the possibility of injury to the occupant is minimized.

A Type 2a shoulder belt shall comply with applicable requirements for a Type 2 seat belt assembly in S4.1 to S4.4, inclusive.

(d) *Hardware.* All hardware parts which contact under normal usage a person, clothing, or webbing shall be free from burrs and sharp edges.

(e) *Release.* A Type 1 or Type 2 seat belt assembly shall be provided with a buckle or buckles readily accessible to the occupant to permit his easy and rapid removal from the assembly. Buckle release mechanism shall be designed to minimize the possibility of accidental release. A buckle with release mechanism in the latched position shall have only one opening in which the tongue can be inserted on the end of the buckle designed to receive and latch the tongue.

(f) *Attachment hardware.* A seat belt assembly shall include all hardware necessary for installation in a motor vehicle in accordance with SAE Recommended Practice J800b, Motor Vehicle Seat Belt Installations, September 1965. However, seat belt assemblies designed for installation in motor vehicles equipped with seat belt assembly anchorages that do not require anchorage nuts, plates, or washers, need not have such hardware, but shall have 7/16-20 UNF-2A or 1/2-13 UNC-2A attachment bolts or equivalent hardware. The hardware shall be designed to prevent attachment bolts and other parts from becoming disengaged from the vehicle while in service. Reinforcing plates or washers furnished for universal floor installations shall be of steel, free from burrs and sharp edges on the peripheral edges adjacent to the vehicle, at least 0.06 inch in thickness and at

least 4 square inches in projected area. The distance between any edge of the plate and the edge of the bolt hole shall be at least 0.6 inch. Any corner shall be rounded to a radius of not less than 0.25 inch or cut so that no corner angle is less than 135° and no side is less than 0.25 inch in length.

(g) *Adjustment.*

(1) A Type 1 or Type 2 seat belt assembly shall be capable of adjustment to fit occupants whose dimensions and weight range from those of a 5th-percentile adult female to those of a 95th-percentile adult male. The seat belt assembly shall have either an automatic-locking retractor, an emergency-locking retractor, or an adjusting device that is within the reach of the occupant.

(2) A Type 1 or Type 2 seat belt assembly for use in a vehicle having seats that are adjustable shall conform to the requirements of S4.1(g) (1) regardless of seat position. However, if a seat has a back that is separately adjustable, the requirements of S4.1(g) (1) need be met only with the seat back in the manufacturer's nominal design riding position.

(3) The adult occupants referred to in S4.1(g) (1) shall have the following measurements:

	5th-percentile adult female	95th-percentile adult male
Weight	102 pounds	215 pounds.
Erect sitting height	30.9 inches	38 inches.
Hip breadth (sitting)	12.8 inches	16.4 inches.
Hip circumference (sitting)	36.4 inches	47.2 inches.
Waist circumference (sitting)	23.6 inches	42.5 inches.
Chest depth	7.5 inches	10.5 inches.
Chest circumference:		
(nipple)	30.5 inches	} 44.5 inches.
(upper)	29.8 inches	
(lower)	26.6 inches	

(h) *Webbing.* The ends of webbing in a seat belt assembly shall be protected or treated to prevent raveling. The end of webbing in a seat belt assembly having a metal-to-metal buckle that is used by the occupant to adjust the size of the assembly shall not pull out of the adjustment hardware at maximum size adjustment. Provision shall be made for essentially unimpeded movement of webbing routed between a seat back and seat cushion and attached to a retractor located behind the seat.



5/2:  
(i) *Strap.* A strap used in a seat belt assembly to sustain restraint forces shall comply with the requirements for webbing in S4.2, and if the strap is made from a rigid material, it shall comply with applicable requirements in S4.2, S4.3 and S4.4.

F  
(j) *Marking.* Each seat belt assembly shall be permanently and legibly marked or labeled with year of manufacture, model, and name or trademark of manufacturer or distributor, or of importer if manufactured outside the United States. A model shall consist of a single combination of webbing having a specific type of fiber weave and construction, and hardware having a specific design. Webbing of various colors may be included under the same model, but webbing of each color shall comply with the requirements for webbing in S4.2.

(k) *Installation instructions.* A seat belt assembly or retractor shall be accompanied by an instruction sheet providing sufficient information for installing the assembly in a motor vehicle except for a seat belt assembly installed in a motor vehicle by an automobile manufacturer. The installation instructions shall state whether the assembly is for universal installation or for installation only in specifically stated motor vehicles, and shall include at least those items in SAE Recommended Practice, Motor Vehicle Seat Belt Installations—SAE J800b, published by the Society of Automotive Engineers.

(l) *Usage and maintenance instructions.* A seat belt assembly or retractor shall be accompanied by written instructions for the proper use of the assembly, stressing particularly the importance of wearing the assembly snugly and properly located on the body, and on the maintenance of the assembly and periodic inspection of all components. The instructions shall show the proper manner of threading webbing in the hardware of seat belt assemblies in which the webbing is not permanently fastened. Instructions for a non-locking retractor shall include a caution that the webbing must be fully extended from the retractor during use of the seat belt assembly unless the retractor is attached to the free end of webbing which is not subjected to any tension during restraint of an occupant by the assembly. Instructions for Type 2a shoulder belt shall include a warning that the shoulder belt is not to be used without a lap belt.

(m) *Workmanship.* Seat belt assemblies shall have good workmanship in accordance with good commercial practice.

#### S4.2 Requirements for webbing.

(a) *Width.* The width of the webbing in a seat belt assembly shall be not less than 1.8 inches, except for portions that do not touch a 95th-percentile adult male with the seat in any adjustment position and the seat back in the manufacturer's nominal design riding position when measured under the conditions prescribed in S5.1(a).

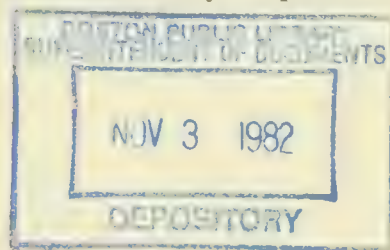
(b) *Breaking strength.* The webbing in a seat belt assembly shall have not less than the following breaking strength when tested by the procedures specified in S5.1(b): Type 1 seat belt assembly—6,000 pounds or 2,720 kilograms; Type 2 seat belt assembly—5,000 pounds or 2,270 kilograms for webbing in pelvic restraint and 4,000 pounds or 1,810 kilograms for webbing in upper-torso restraint.

(c) *Elongation.* Except as provided in S4.5, the webbing in a seat belt assembly shall not be extended to more than the following elongations when subjected to the specified forces in accordance with the procedure specified in S5.1(c): Type 1 seat belt assembly—20 percent at 2,500 pounds or 1,130 kilograms; Type 2 seat belt assembly—30 percent at 2,500 pounds or 1,130 kilograms for webbing in pelvic restraint and 40 percent at 2,500 pounds or 1,130 kilograms for webbing in upper-torso restraint.

[(d) *Resistance to abrasion.* The webbing of a seat belt assembly, after being subjected to abrasion as specified in S5.1(d) or S5.3(c), shall have a breaking strength of not less than 75 percent of the breaking strength listed in S4.2(b) for that type of belt assembly. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)]

(e) *Resistance to light.* The webbing in a seat belt assembly after exposure to the light of a carbon arc and tested by the procedure specified in S5.1(e) shall have a breaking strength not less than 60 percent of the strength before exposure to the carbon arc and shall have a color retention not less than No. 2 on the Geometric Gray Scale published by the American Association of Textile Chemists and Colorists, Post Office Box 886, Durham, N.C.

(f) *Resistance to micro-organisms.* The webbing in a seat belt assembly after being subjected to micro-organisms and tested by the procedures





specified in S5.1(f) shall have a breaking strength not less than 85 percent of the strength before subjection to micro-organisms.

(g) *Colorfastness to crocking.* The webbing in a seat belt assembly shall not transfer color to a crock cloth either wet or dry to a greater degree than class 3 on the AATCC Chart for Measuring Transference of Color published by the American Association of Textile Chemists and Colorists, when tested by the procedure specified in S5.1(g).

(h) *Colorfastness to staining.* The webbing in a seat belt assembly shall not stain to a greater degree than class 3 on the AATCC Chart for Measuring Transference of Color published by the American Association of Textile Chemists and Colorists, when tested by the procedure specified in S5.1(h).

#### **S4.3 Requirements for hardware.**

##### *(a) Corrosion resistance.*

(1) Attachment hardware of a seat belt assembly after being subjected to the conditions specified in S5.2(a) shall be free of ferrous corrosion on significant surfaces except for permissible ferrous corrosion at peripheral edges or edges of holes on underfloor reinforcing plates and washers. Alternatively, such hardware at or near the floor shall be protected against corrosion by at least a Type KS electrodeposited coating of nickel, or copper and nickel, and other attachment hardware shall be protected by a Type QS electrodeposited coating of nickel or copper and nickel, in accordance with Tentative Specifications for Electrodeposited Coatings of Nickel and Chromium on Steel, ASTM Designation: A166-61T, published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103, but such hardware shall not be racked for electroplating in locations subjected to maximum stresses.

(2) Surfaces of buckles, retractors and metallic parts, other than attachment hardware, of a seat belt assembly after subjection to the conditions specified in S5.2(a) shall be free of ferrous or nonferrous corrosion which may be transferred, either directly or by means of the webbing, to the occupant or his clothing when the assembly is worn. After test, buckles shall conform to applicable requirements in paragraphs (d) to (g) of this section.

(b) *Temperature resistance.* Plastic or other nonmetallic hardware parts of a seat belt assembly when subjected to the conditions specified in S5.2(b) shall not warp or otherwise deteriorate to cause the assembly to operate improperly or fail to comply with applicable requirements in this section and S4.4.

##### *(c) Attachment hardware.*

(1) Eye bolts, shoulder bolts, or other bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall withstand a force of 9,000 pounds or 4,080 kilograms when tested by the procedure specified in S5.2(c) (1), except that attachment bolts of a seat belt assembly designed for installation in specific models of motor vehicles in which the ends of two or more seat belt assemblies can not be attached to the vehicle by a single bolt shall have a breaking strength of not less than 5,000 pounds or 2,270 kilograms.

(2) Other attachment hardware designed to receive the ends of two seat belt assemblies shall withstand a tensile force of at least 6,000 pounds or 2,720 kilograms without fracture of any section when tested by the procedure specified in S5.2(c) (2).

(3) A seat belt assembly having single attachment hooks of the quick-disconnect type for connecting webbing to an eye bolt shall be provided with a retaining latch or keeper which shall not move more than 0.08 inch or 2 millimeters in either the vertical or horizontal direction when tested by the procedure specified in S5.2(c) (3).

##### *(d) Buckle release.*

(1) The buckle of a Type 1 or Type 2 seat belt assembly shall release when a force of not more than 30 pounds or 14 kilograms is applied.

(2) A buckle designed for pushbutton application of buckle release force shall have a minimum area of 0.7 square inch or 4.5 square centimeters with a minimum linear dimension of 0.4 inch or 10 millimeters for applying the release force, or a buckle designed for lever application of a buckle release force shall permit the insertion of a cylinder 0.4 inch or 10 millimeters in diameter and 1.5 inches or 38 millimeters in length to at least the midpoint of the cylinder along the cylinder's entire length in the actuation portion of the buckle release. A buckle having other design for release shall have adequate access for two or more fingers to actuate release.

(3) The buckle of a Type 1 or Type 2 seat belt assembly shall not release under a compressive force of 400 pounds applied as prescribed in paragraph S5.2(d)(3). The buckle shall be operable and shall meet the applicable requirements of paragraph S4.4 after the compressive force has been removed.

(e) *Adjustment force.* The force required to decrease the size of a seat belt assembly shall not exceed 11 pounds or 5 kilograms when measured by the procedure specified in S5.2(e).

(f) *Tilt-lock adjustment.* The buckle of a seat belt assembly having tilt-lock adjustment shall lock the webbing when tested by the procedure specified in S5.2(f) at an angle of not less than 30 degrees between the base of the buckle and the anchor webbing.

(g) *Buckle latch.* The buckle latch of a seat belt assembly when tested by the procedure specified in S5.2(g) shall not fail, nor gall or wear to an extent that normal latching and unlatching is impaired, and a metal-to-metal buckle shall separate when in any position of partial engagement by a force of not more than 5 pounds or 2.3 kilograms.

(h) *Nonlocking retractor.* The webbing of a seat belt assembly shall extend from a nonlocking retractor within 0.25 inch or 6 millimeters of maximum length when a tension is applied as prescribed in S5.2(h). A nonlocking retractor on upper-torso restraint shall be attached to the nonadjustable end of the assembly, the reel of the retractor shall be easily visible to an occupant while wearing the assembly, and the maximum retraction force shall not exceed 1.1 pounds or 0.5 kilogram in any strap or webbing that contacts the shoulder when measured by the procedure specified in S5.2(h), unless the retractor is attached to the free end of webbing which is not subjected to any tension during restraint of an occupant by the assembly.

(i) *Automatic-locking retractor.* The webbing of a seat belt assembly equipped with an automatic-locking retractor, when tested by the procedure specified in S5.2(i), shall not move more than 1 inch or 25 millimeters between locking positions of the retractor, and shall be retracted with a force under zero acceleration of not less than 0.6 pound or 0.27 kilogram when attached to pelvic restraint, and not less than 0.45 pound or 0.2 kilogram nor more than 1.1 pounds or 0.5 kilogram in any strap or

webbing that contacts the shoulder of an occupant when the retractor is attached to upper-torso restraint. An automatic-locking retractor attached to upper-torso restraint shall not increase the restraint on the occupant of the seat belt assembly during use in a vehicle traveling over rough roads as prescribed in S5.2(i).

(j) *Emergency-locking retractor.* An emergency-locking retractor of a Type 1 or Type 2 seat belt assembly, when tested in accordance with the procedures specified in paragraph S5.2(j)—

(1) Shall lock before the webbing extends 1 inch when the retractor is subjected to an acceleration of 0.7g;

(2) Shall not lock, if the retractor is sensitive to webbing withdrawal, before the webbing extends 2 inches when the retractor is subjected to an acceleration of 0.3g or less;

(3) Shall not lock, if the retractor is sensitive to vehicle acceleration, when the retractor is rotated in any direction to any angle of 15° or less from its orientation in the vehicle;

(4) Shall exert a retroactive force of at least 0.6 pound under zero acceleration when attached only to the pelvic restraint;

(5) Shall exert a retractive force of not less than 0.2 pound and not more than 1.1 pounds under zero acceleration when attached only to an upper-torso restraint;

(6) Shall exert a retractive force of not less than 0.2 pound and not more than 1.5 pounds under zero acceleration when attached to a strap or webbing that restrains both the upper torso and the pelvis.

(k) *Performance of retractor.* A retractor used on a seat belt assembly after subjection to the tests specified in S5.2(k) shall comply with applicable requirements in paragraphs (h) to (j) of this section and S4.4, except that the retraction force shall be not less than 50 percent of its original retraction force.

#### **S4.4 Requirements for assembly performance.**

(a) *Type 1 seat belt assembly.* Except as provided in S4.5, the complete seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedures specified in S5.3(a):

(1) The assembly loop shall withstand a force of not less than 5,000 pounds or 2,270 kilograms;



that is, each structural component of the assembly shall withstand a force of not less than 2,500 pounds or 1,130 kilograms.

(2) The assembly loop shall extend not more than 7 inches or 18 centimeters when subjected to a force of 5,000 pounds or 2,270 kilograms; that is, the length of the assembly between anchorages shall not increase more than 14 inches or 36 centimeters.

(3) Any webbing cut by the hardware during test shall have a breaking strength at the cut of not less than 4,200 pounds or 1,910 kilograms.

(4) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

(b) *Type 2 seat belt assembly.* Except as provided in S4.5, the components of a Type 2 seat belt assembly including webbing, straps, buckles, adjustment and attachment hardware, and retractors shall comply with the following requirements when tested by the procedure specified in S5.3(b):

(1) The structural components in the pelvic restraint shall withstand a force of not less than 2,500 pounds or 1,139 kilograms.

(2) The structural components in the upper torso restraint shall withstand a force of not less than 1,500 pounds or 680 kilograms.

(3) The structural components in the assembly that are common to pelvic and upper torso restraints shall withstand a force of not less than 3,000 pounds or 1,360 kilograms.

(4) The length of the pelvic restraint between anchorages shall not increase more than 20 inches or 50 centimeters when subjected to a force of 2,500 pounds or 1,130 kilograms.

(5) The length of the upper torso restraint between anchorages shall not increase more than 20 inches or 50 centimeters when subjected to a force of 1,500 pounds or 680 kilograms.

(6) Any webbing cut by the hardware during test shall have a breaking strength of not less than 3,500 pounds or 1,590 kilograms at a cut in webbing of the pelvic restraint, or not less than 2,800 pounds or 1,270 kilograms at a cut in webbing of the upper-torso restraint.

(7) Complete fracture through any solid section of metal attachment hardware shall not occur during test.

#### **[S4.5 Load-limiter.**

(a) A Type 1 or Type 2 seat belt assembly that includes a load-limiter is not required to comply with the elongation requirements of S4.2(c), S4.4(a)(2), S4.4(b)(4) or S4.4(b)(5).

(b) A Type 1 or Type 2 seat belt assembly that includes a load-limiter and that does not comply with the elongation requirements of this standard may be installed in motor vehicles only in conjunction with an automatic restraint system as part of a total occupant restraint system.

(c) In addition to the marking requirements specified in S4.1(k), a Type 1 or Type 2 seat belt assembly that includes a load-limiter and that does not comply with the elongation requirements of this standard shall be permanently and legibly marked or labeled with the following words:

"This seat belt assembly may only be installed in vehicles in combination with an automatic restraint system such as an air cushion or an automatic belt." (46 F.R. 2618—January 12, 1981. Effective: 1/12/81)]

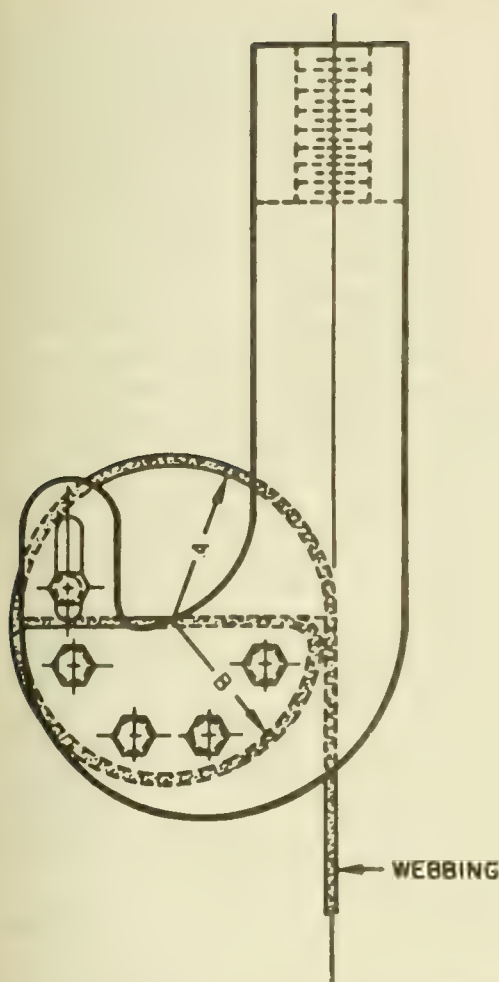
#### **S5. Demonstration Procedures.**

##### **S5.1 Webbing.**

(a) *Width.* The width of webbing from three seat belt assemblies shall be measured after conditioning for at least 24 hours in an atmosphere having relative humidity between 48 and 67 percent and a temperature of  $23^{\circ} \pm 2^{\circ}$  or  $73.4^{\circ} \pm 3.6^{\circ}$ . The tension during measurement of width shall be not more than 5 pounds or 2 kilograms on webbing from a Type 1 or Type 3 seat belt assembly, and  $2,200 \pm 100$  pounds or  $1,000 \pm 50$  kilograms on webbing from a Type 2 seat belt assembly. The width of webbing from a Type 2 seat belt assembly may be measured during the breaking strength test described in paragraph (b) of this section.

(b) *Breaking strength.* Webbing from three seat belt assemblies shall be conditioned in accordance with paragraph (a) of this section and tested for breaking strength in a testing machine of suitable capacity verified to have an error of not more than 1 percent in the range of the breaking strength of the webbing by the Tentative Methods of Verification of Testing Machines, ASTM Designation: E4-64, published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.





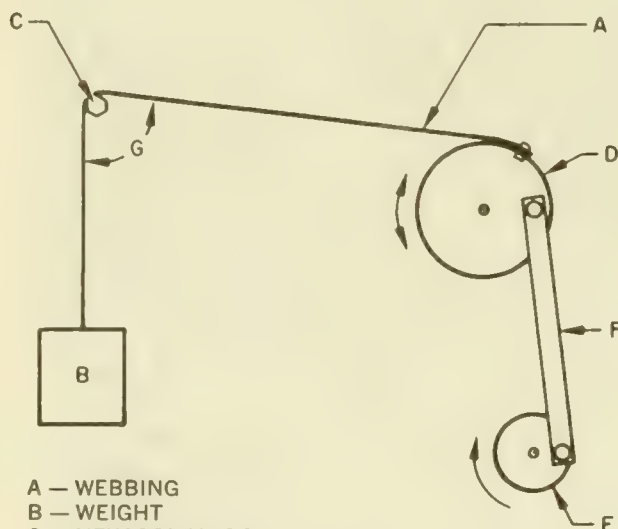
A 1 TO 2 INCHES OR 2.5 TO 5 CENTIMETERS  
B A MINUS 0.06 INCH 0.15 CENTIMETER

FIGURE 1

The machine shall be equipped with split drum grips illustrated in Figure 1, having a diameter between 2 and 4 inches or 5 and 10 centimeters. The rate of grip separation shall be between 2 and 4 inches per minute or 5 and 10 centimeters per minute. The distance between the centers of the grips at the start of the test shall be between 4 and 10 inches or 10 and 25 centimeters. After placing the specimen in the grips, the webbing shall be stretched continuously at a uniform rate to failure. Each value shall be not less than the applicable breaking strength requirement in S4.2(b), but the median value shall be used for determining the retention of breaking strength in paragraphs (d), (e), and (f) of this section.

(c) *Elongation.* Elongation shall be measured during the breaking strength test described in paragraph (b) of this section by the following procedure: A preload between 44 and 55 pounds or 20 and 25 kilograms shall be placed on the webbing mounted in the grips of the testing machine and the needle points of an extensometer, in which the points remain parallel during test, are inserted in the center of the specimen. Initially the points shall be set at a known distance apart between 4 and 8 inches or 10 and 20 centimeters. When the force on the webbing reaches the value specified in S4.2(c), the increase in separation of the points of the extensometer shall be measured and the percent elongation shall be calculated to the nearest 0.5 percent. Each value shall be not more than the appropriate elongation requirement in S4.2(c).

(d) *Resistance to abrasion.* The webbing from three seat belt assemblies shall be tested for resistance to abrasion by rubbing over the hexagon bar prescribed in Figure 2 in the following manner:



A — WEBBING  
B — WEIGHT  
C — HEXAGONAL ROD  
STEEL — SAE 51416  
ROCKWELL HARDNESS — B-97 TO B-101  
SURFACE — COLD DRAWN FINISH  
SIZE —  $0.250 \pm 0.001$  INCH OR  
 $6.35 \pm 0.03$  MILLIMETER  
RADIUS ON EDGES —  $0.020 \pm 0.004$  INCH OR  
 $0.5 \pm 0.1$  MILLIMETER  
D — DRUM DIAMETER — 16 INCHES OR  
40 CENTIMETERS  
E — CRANK  
F — CRANK ARM  
G — ANGLE BETWEEN WEBBING —  $85 \pm 2$  DEGS.

FIGURE 2

The webbing shall be mounted in the apparatus shown schematically in Figure 2. One end of the webbing (A) shall be attached to a weight (B) which has a mass of  $5.2 \pm 0.1$  pounds or  $2.35 \pm 0.05$  kilograms, except that a mass of  $3.3 \pm 0.1$  pounds or  $1.50 \pm 0.05$  kilograms shall be used for webbing in pelvic and upper-torso restraints of a belt assembly used in a child restraint system. The webbing shall be passed over the two new abrading edges of the hexagon bar (C) and the other end attached to an oscillating drum (D) which has a stroke of 13 inches or 33 centimeters. Suitable guides shall be used to prevent movement of the webbing along the axis of hexagonal bar C. Drum D shall be oscillated for 5,000 strokes or 2,500 cycles at a rate of  $60 \pm 2$  strokes per minute or  $30 \pm 1$  cycles per minute. The abraded webbing shall be conditioned as prescribed in paragraph (a) of this section and tested for breaking strength by the procedure described in paragraph (b) of this section. The median values for the breaking strengths determined on abraded and unabraded specimens shall be used to calculate the percentage of braking strength retained.

(e) *Resistance to light.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall be suspended vertically on the inside of the specimen rack in a Type E carbon-arc light-exposure apparatus described in Recommended Practice for Operation of Light and Water-Exposure Apparatus (Carbon-Arc Type) for Artificial Weathering Test, ASTM Designation: E42-64, published by the American Society for Testing and Materials. The apparatus shall be operated without water spray at an air temperature of  $60^\circ \pm 2^\circ$  or  $140^\circ \pm 3.6^\circ$  measured at a point  $1.0 \pm 0.2$  inch or  $25 \pm 5$  millimeters outside the specimen rack and midway in height. The temperature sensing element shall be shielded from radiation. The specimens shall be exposed to the light from the carbon arc for 100 hours and then conditioned as prescribed in paragraph (a) of this section. The colorfastness of the exposed and conditioned specimens shall be determined on the Geometric Gray Scale issued by the American Association of Textile Chemists and Colorists. The breaking strength of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

(f) *Resistance to micro-organisms.* Webbing at least 20 inches or 50 centimeters in length from three seat belt assemblies shall be subjected successively to the procedures prescribed in Section 1C1—Water Leaching, Section 1C2—Volatilization, and Section 1B3—Soil Burial Test of AATCC Tentative Test Method 30—1957T, Fungicides, Evaluation of Textiles; Mildew and Rot Resistance of Textiles, published by American Association of Textile Chemists and Colorists. After soil-burial for a period of 2 weeks, the specimen shall be washed in water, dried and conditioned as prescribed in paragraph (a) of this section. The breaking strengths of the specimens shall be determined by the procedure prescribed in paragraph (b) of this section. The median values for the breaking strengths determined on exposed and unexposed specimens shall be used to calculate the percentage of breaking strength retained.

NOTE.—This test shall not be required on webbing made from material which is inherently resistant to micro-organisms.

(g) *Colorfastness to crocking.* Webbing from three seat belt assemblies shall be tested by the procedure specified in Standard Test Method 8—1961, Colorfastness to Crocking (Rubbing) published by the American Association of Textile Chemists and Colorists.

(h) *Colorfastness to staining.* Webbing from three seat belt assemblies shall be tested by the procedure specified in Standard Test Method 107—1962, Colorfastness to Water, published by the American Association of Textile Chemists and Colorists, with the following modifications: Distilled water shall be used, perspiration tester shall be used, the drying time in paragraph 4 of procedures shall be 4 hours, and section entitled "Evaluation Method for Staining (3)" shall be used to determine colorfastness to staining on the AATCC Chart for Measuring Transference of Colors.

## S5.2 Hardware.

(a) *Corrosion resistance.* Three seat belt assemblies shall be tested by Standard Method of Salt Spray (Fog) Testing, ASTM Designation: B117-64, published by the American Society for Testing and Materials. The period of test shall be 50 hours for all attachment hardware at or near the floor, consisting of two periods of 24 hours exposure to salt spray followed by 1 hour drying and 25 hours for all other hardware, consisting of



one period of 24 hours exposure to salt spray followed by 1 hour drying. In the salt spray test chamber, the parts from the three assemblies shall be oriented differently, selecting those orientations most likely to develop corrosion on the larger areas. At the end of test, the seat belt assembly shall be washed thoroughly with water to remove the salt. After drying for at least 24 hours under standard laboratory conditions specified in S5.1(a) attachment hardware shall be examined for ferrous corrosion on significant surfaces, that is, all surfaces that can be contacted by a sphere 0.75 inch or 2 centimeters in diameter, and other hardware shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the hardware.

NOTE.—When attachment and other hardware are permanently fastened, by sewing or other means, to the same piece of webbing, separate assemblies shall be used to test the two types of hardware. The test for corrosion resistance shall not be required for attachment hardware made from corrosion-resistant steel containing at least 11.5 percent chromium or for attachment hardware protected with an electro-deposited coating of nickel, or copper and nickel, as prescribed in S4.3(a). The assembly that has been used to test the corrosion resistance of the buckle shall be used to measure adjustment force, tilt-lock

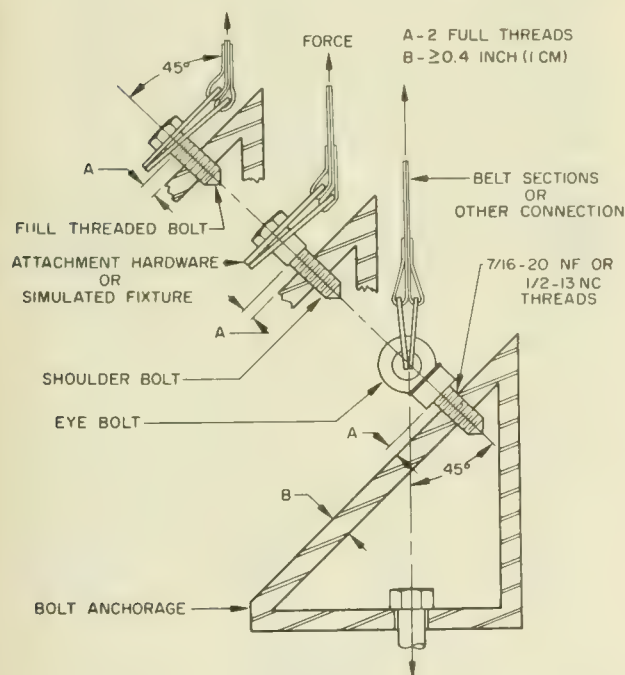


FIGURE 3

adjustment, and buckle latch in paragraphs (e), (f) and (g), respectively, of this section, assembly performance in S5.3 and buckle release force in paragraph (d) of this section.

(b) *Temperature resistance.* Three seat belt assemblies having plastic or nonmetallic hardware or having retractors shall be subjected to the conditions prescribed in Procedure IV of Standard Methods of Test for Resistance of Plastics to Accelerated Service Conditions published by the American Society for Testing and Materials, under designation D 756-56. The dimension and weight measurement shall be omitted. Buckles shall be unlatched and retractors shall be fully retracted during conditioning. The hardware parts after conditioning shall be used for all applicable tests in S4.3 and S4.4.

(c) *Attachment hardware.*

(1) Attachment bolts used to secure the pelvic restraint of a seat belt assembly to a motor vehicle shall be tested in a manner similar to that shown in Figure 3. The load shall be applied at an angle of 45 degrees to the axis of the bolt through attachment hardware from the seat belt assembly, or through a special fixture which simulates the loading applied by the attachment hardware. The attachment hardware or simulated fixture shall be fastened by the bolt to the anchorage shown in Figure 3, which has a standard 7/16-20 UNF-2B or 1/2-13 UNC-2B threaded hole in a hardened steel plate at least 0.4 inch or 1 centimeter in thickness. The bolt shall be installed with two full threads exposed from the fully seated position. The appropriate force required by S4.3(c) shall be applied. A bolt from each of three seat belt assemblies shall be tested.

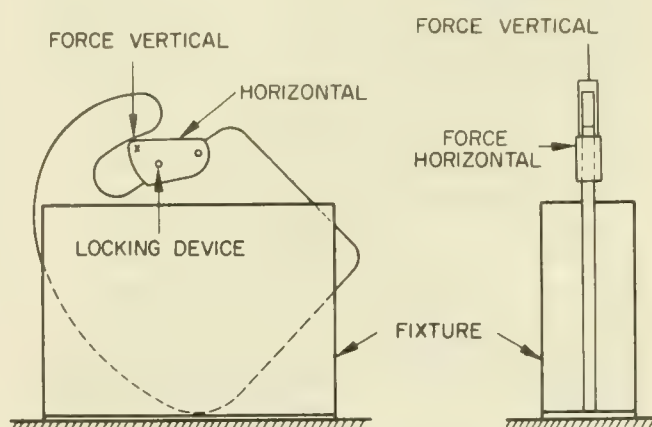


FIGURE 4  
SINGLE ATTACHMENT HOOK



(2) Attachment hardware, other than bolts, designed to receive the ends of two seat belt assemblies shall be subjected to a tensile force of 6,000 pounds or 2,720 kilograms in a manner simulating use. The hardware shall be examined for fracture after the force is released. Attachment hardware from three seat belt assemblies shall be tested.

(3) Single attachment hook for connecting webbing to any eye bolt shall be tested in the following manner: The hook shall be held rigidly so that the retainer latch or keeper, with cotter pin or other locking device in place, is in a horizontal position as shown in Figure 4. A force of  $150 \pm 2$  pounds or  $68 \pm 1$  kilograms shall be applied vertically as near as possible to the free end of the retainer latch, and the movement of the latch by this force at the point of application shall be measured. The vertical force shall be released, and a force of  $150 \pm 2$  pounds or  $68 \pm 1$  kilograms shall be applied horizontally as near as possible to the free end of the retainer latch. The movement of the latch by this force at the point of load application shall be measured. Alternatively, the hook may be held in other positions, provided the forces are applied and the movements of the latch are measured at the points indicated in Figure 4. A single attachment hook from each of three seat belt assemblies shall be tested.

(d) *Buckle release.*

(1) Three seat belt assemblies shall be tested to determine compliance with the maximum buckle release force requirements, following the assembly test in S5.3. After subjection to the force applicable for the assembly being tested, the force shall be reduced and maintained at 150 pounds on the assembly loop of a Type 1 seat belt assembly, 75 pounds on the components of a Type 2 seat belt assembly, or 45 pounds on a Type 3 seat belt assembly. The buckle release force shall be measured by applying a force on the buckle in a manner and direction typical of those which would be employed by a seat belt occupant. For pushbutton-release buckles, the force shall be applied at least 0.125 inch from the edge of the push-button access opening of the buckle in a direction that produces maximum releasing effect. For lever-release buckles, the force shall be applied on the centerline of the buckle level or finger tab in a direction that produces maximum releasing effect.

(2) The area for application of release force on pushbutton actuated buckle shall be measured to the nearest 0.05 square inch or 0.3 square centimeter. The cylinder specified in S4.3(d) shall be inserted in the actuation portion of a lever release buckle for determination of compliance with the requirement. A buckle with other release actuation shall be examined for access of release by fingers.

(3) The buckle of a Type 1 or Type 2 seat belt assembly shall be subjected to a compressive force of 400 pounds applied anywhere on a test line that is coincident with the centerline of the belt extended through the buckle or on any line that extends over the center of the release mechanism and intersects the extended centerline of the belt at an angle of  $60^\circ$ . The load shall be applied by using a curved cylindrical bar having a cross section diameter of 0.75 inch and a radius of curvature of 6 inches, placed with its longitudinal centerline along the test line and its center directly above the point on the buckle to which the load will be applied. The buckle shall be latched, and a tensile force of 75 pounds shall be applied to the connected webbing during the application of the compressive force. Buckles from three seat belt assemblies shall be tested to determine compliance with paragraph S4.3(d) (3).

(e) *Adjustment force.* Three seat belt assemblies shall be tested for adjustment force on the webbing at the buckle, or other manual adjusting device normally used to adjust the size of the assembly. With no load on the anchor end, the webbing shall be drawn through the adjusting device at a rate of  $20 \pm 2$  inches per minute or  $50 \pm 5$  centimeters per minute and the maximum force shall be measured to the nearest 0.25 pound or 0.1 kilogram after the first 1.0 inch or 25 millimeters of webbing movement. The webbing shall be precycled 10 times prior to measurement.

(f) *Tilt-lock adjustment.* This test shall be made on buckles or other manual adjusting devices having tilt-lock adjustment normally used to adjust the size of the assembly. Three buckles or devices shall be tested. The base of the adjustment mechanism and the anchor end of the webbing shall be oriented in planes normal to each other. The webbing shall be drawn through the adjustment mechanism in a direction to increase belt length at a rate of  $20 \pm 2$  inches per minute or  $50 \pm 5$  centimeters per minute

while the plane of the base is slowly rotated in a direction to lock the webbing. Rotation shall be stopped when the webbing locks, but the pull on the webbing shall be continued until there is a resistance of at least 20 pounds or 9 kilograms. The locking angle between the anchor end of the webbing and the base of the adjustment mechanism shall be measured to the nearest degree. The webbing shall be precycled 10 times prior to measurement.

(g) *Buckle latch.* The buckles from three seat belt assemblies shall be opened fully and closed at least 10 times. [Then the buckles shall be clamped or firmly held against a flat surface so as to permit normal movement of buckle parts, but with the metal mating plate (metal-to-metal buckles) or webbing end (metal-to-webbing buckles) withdrawn from the buckle. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)] The release mechanism shall be moved 200 times through the maximum possible travel against its stop with a force of  $30 \pm 3$  pounds or  $14 \pm 1$  kilograms at a rate not to exceed 30 cycles per minute. The buckle shall be examined to determine compliance with the performance requirements of S4.3(g). A metal-to-metal buckle shall be examined to determine whether partial engagement is possible by means of any technique representative of actual use. If partial engagement is possible, the maximum force of separation when in such partial engagement shall be determined.

(h) *Nonlocking retractor.* After the retractor is cycled 10 times by full extension and retraction of the webbing, the retractor and webbing shall be suspended vertically and a force of 4 pounds or 1.8 kilograms shall be applied to extend the webbing from the retractor. The force shall be reduced to 3 pounds or 1.4 kilograms when attached to a pelvic restraint, or to 1.1 pounds or 0.5 kilogram per strap or webbing that contacts the shoulder of an occupant when retractor is attached to an upper-torso restraint. The residual extension of the webbing shall be measured by manual rotation of the retractor drum or by disengaging the retraction mechanism. Measurements shall be made on three retractors. The location of the retractor attached to upper-torso restraint shall be examined for visibility of reel during use of seat belt assembly in a vehicle.

NOTE.—This test shall not be required on a nonlocking retractor attached to the free-end of webbing which is not subjected to any tension during restraint of an occupant by the assembly.

(i) *Automatic-locking retractor.* Three retractors shall be tested in a manner to permit the retraction force to be determined exclusive of the gravitational forces on hardware or webbing being retracted. The webbing shall be fully extended from the retractor. While the webbing is being retracted, the average force of retraction within plus or minus 2 inches or 5 centimeters of 75 percent extension (25-percent retraction) shall be determined and the webbing movement between adjacent locking segments shall be measured in the same region of extension. A seat belt assembly with automatic locking retractor in upper torso restraint shall be tested in a vehicle in a manner prescribed by the installation and usage instructions. The retraction force on the occupant of the seat belt assembly shall be determined before and after traveling for 10 minutes at a speed of 15 miles per hour or 24 kilometers per hour or more over a rough road (e.g., Belgian block road) where the occupant is subjected to displacement with respect to the vehicle in both horizontal and vertical directions. Measurements shall be made with the vehicle stopped and the occupant in the normal seated position.

(j) *Emergency-locking retractor.* A retractor shall be tested in a manner that permits the retraction force to be determined exclusive of the gravitational forces on hardware or webbing being retracted. The webbing shall be fully extended from the retractor, passing over or through any hardware or other material specified in the installation instructions. While the webbing is being retracted, the lowest force of retraction within plus or minus 2 inches of 75 percent extension shall be determined. A retractor that is sensitive to webbing withdrawal shall be subjected to an acceleration of 0.3g within a period of 50 milliseconds while the webbing is at 75-percent extension, to determine compliance with S4.3(j) (2). The retractor shall be subjected to an acceleration of 0.7g within a period of 50 milliseconds, while the webbing is at 75-percent extension, and the webbing movement before locking shall be measured under the following conditions: For a retractor sensitive to webbing withdrawal, the retractor shall be accelerated in the direction of webbing retraction while the retractor drum's central axis is oriented horizontally and at angles of 45°, 90°, 135°, and 180° to the horizontal plane. For a retractor sensitive to vehicle acceleration, the retractor shall be—



(1) accelerated in the horizontal plane in two directions normal to each other, while the retractor drum's central axis is oriented at the angle at which it is installed in the vehicle; and,

(2) accelerated in three directions normal to each other while the retractor drum's central axis is oriented at angles of 45°, 90°, 135° and 180° from the angle at which it is installed in the vehicle, unless the retractor locks by gravitational force when tilted in any direction to any angle greater than 45° from the angle at which it is installed in the vehicle.

(k) *Performance of retractor.* After completion of the corrosion-resistance test described in paragraph (a) of this section, the webbing shall be fully extended and allowed to dry for at least 24 hours under standard laboratory conditions specified in S5.1(a). [The retractor shall be examined for ferrous and nonferrous corrosion which may be transferred, either directly or by means of the webbing, to a person or his clothing during use of a seat belt assembly incorporating the retractor, and for ferrous corrosion on significant surfaces if the retractor is part of the attachment hardware. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)] The webbing shall be withdrawn manually and allowed to retract for 25 cycles. The retractor shall be mounted in an apparatus capable of extending the webbing fully, applying a force of 20 pounds or 9 kilograms at full extension, and allowing the webbing to retract freely and completely. The webbing shall be withdrawn from the retractor and allowed to retract repeatedly in this apparatus until 2,500 cycles are completed. The retractor and webbing shall then be subjected to the temperature resistance test prescribed in paragraph (b) of this section. The retractor shall be subjected to 2,500 additional cycles of webbing withdrawal and retraction. Then, the retractor and webbing shall be subjected to dust in a chamber similar to one illustrated in Figure 6 containing about 2 pounds or 0.9 kilogram of coarse grade dust conforming to the specification given in SAE Recommended Practice, Air Cleaner Test Code—SAE J726a, published by the Society of Automotive Engineers. The dust shall be agitated every 20 minutes for 5 seconds by compressed air, free of oil and moisture, at a gauge pressure of  $80 \pm 8$  pounds per square inch or  $5.6 \pm 0.6$  kilograms per square centimeter entering through an orifice  $0.060 \pm 0.004$  inch or  $1.5 \pm 0.1$  millimeters in diameter. The webbing shall be ex-

tended to the top of the chamber and kept extended at all times except that the webbing shall be subjected to 10 cycles of complete retraction and extension within 1 to 2 minutes after each agitation of the dust. At the end of 5 hours, the assembly shall be removed from the chamber. The webbing shall be fully withdrawn from the retractor manually and allowed to retract completely for 25 cycles. An automatic-locking retractor or a nonlocking retractor attached to pelvic restraint shall be subjected to 5,000 additional cycles of webbing withdrawal and retraction. An emergency-locking retractor or a nonlocking retractor attached to upper-torso restraint shall be subjected to 45,000 additional cycles of webbing withdrawal and retraction between 50 and 100 percent extension. The locking mechanism of an emergency-lock-

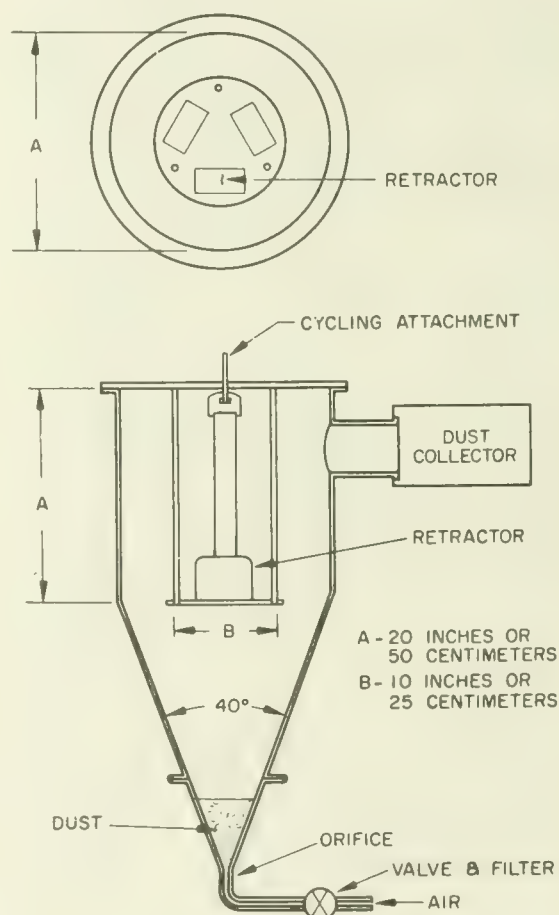


FIGURE 6



ing retractor shall be actuated at least 10,000 times within 50 to 100 percent extension of webbing during the 50,000 cycles. At the end of test, compliance of the retractors with applicable requirements in S4.3(h), (i), and (j) shall be determined. Three retractors shall be tested for performance.

### S5.3 Assembly Performance.

(a) *Type 1 seat belt assembly.* Three complete seat belt assemblies, including webbing, straps, buckles, adjustment and attachment hardware, and retractors, arranged in the form of a loop as shown in Figure 5, shall be tested in the following manner:

(1) The testing machine shall conform to the requirements specified in S5.1(b). A double-roller block shall be attached to one head of the testing machine. This block shall consist of 2 rollers 4 inches or 10 centimeters in diameter and sufficiently long so that no part of the seat belt assembly touches parts of the block other than the rollers during test. The rollers shall be mounted on anti-friction bearings and spaced 12 inches or 30 centimeters between centers, and shall have sufficient capacity so that there is no brinelling, bending or other distortion of parts which may affect the results. An anchorage bar shall be fastened to the other head of the testing machine.

(2) The attachment hardware furnished with the seat belt assembly shall be attached to the anchorage bar. The anchor points shall be spaced so that the webbing is parallel in the two sides of the loop. The attaching bolts shall be parallel to, or at an angle of 45 or 90 degrees to the webbing, whichever results in an angle nearest to 90 degrees between webbing and attachment hardware except that eye bolts shall be vertical, and attaching bolts or nonthreaded anchorages of a seat belt assembly designed for use in specific models of motor vehicles shall be installed to produce the maximum angle in use indicated by the installation instructions, utilizing special fixtures if necessary to simulate installation in the motor vehicle. Rigid adapters between anchorage bar and attachment hardware shall be used if necessary to locate and orient the adjustment hardware. The adapters shall have a flat support face perpendicular to the threaded hole for the attaching bolt and adequate in area to provide full sup-

port for the base of the attachment hardware connected to the webbing. If necessary, a washer shall be used under a swivel plate or other attachment hardware to prevent the webbing from being damaged as the attaching bolt is tightened.

(3) The length of the assembly loop from attaching bolt to attaching bolt shall be adjusted to about 51 inches or 130 centimeters, or as near thereto as possible. A force of 55 pounds or 25 kilograms shall be applied to the loop to remove any slack in webbing at hardware. The force shall be removed and the heads of the testing machine shall be adjusted for an assembly loop between 48 and 50 inches or 122 and 127 centimeters in length. The length of the assembly loop shall then be adjusted by applying a force between 20 and 22 pounds or 9 and 10 kilograms to the free end of the webbing at the buckle, or by the retraction force of an automatic-locking or emergency-locking retractor. A seat belt assem-

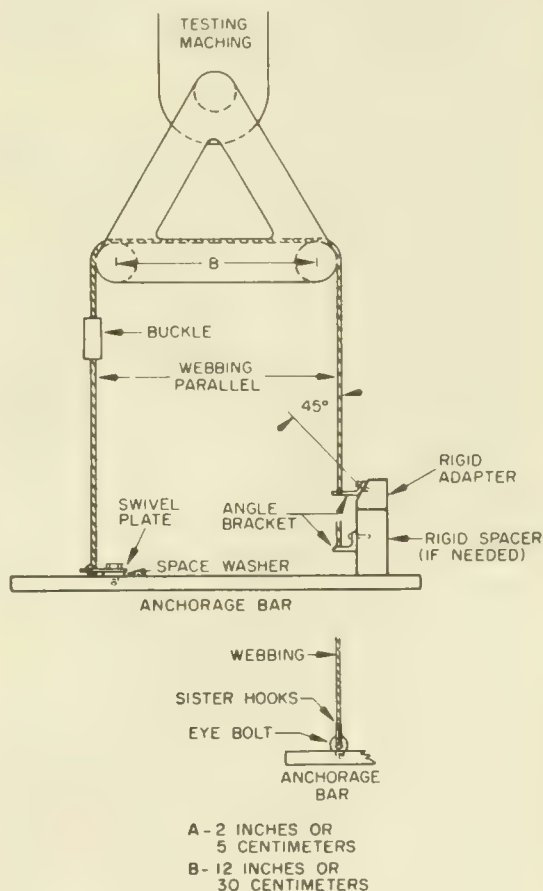


FIGURE 5

bly that cannot be adjusted to this length shall be adjusted as closely as possible. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The buckle shall be in a location so that it does not touch the rollers during test, but to facilitate making the buckle release test in S5.2(d) the buckle should be between the rollers or near a roller in one leg.

(4) The heads of the testing machine shall be separated at a rate between 2 and 4 inches per minute or 5 and 10 centimeters per minute until a force of  $5,000 \pm 50$  pounds or  $2,270 \pm 20$  kilograms is applied to the assembly loop. The extension of the loop shall be determined from measurements of head separation before and after the force is applied. The force shall be decreased to  $150 \pm 10$  pounds or  $68 \pm 4$  kilograms and the buckle release force measured as prescribed in S5.2(d).

(5) After the buckle is released, the webbing shall be examined for cutting by the hardware. If the yarns are partially or completely severed in a line for a distance of 10 percent or more of the webbing width, the cut webbing shall be tested for breaking strength as specified in S5.1(b) locating the cut in the free length between grips. If there is insufficient webbing on either side of the cut to make such a test for breaking strength, another seat belt assembly shall be used with the webbing repositioned in the hardware. A tensile force of  $2,500 \pm 25$  pounds or  $1,135 \pm 10$  kilograms shall be applied to the components or a force of  $5,000 \pm 50$  pounds or  $2,270 \pm 20$  kilograms shall be applied to an assembly loop. After the force is removed, the breaking strength of the cut webbing shall be determined as prescribed above.

(6) If a Type 1 seat belt assembly includes an automatic-locking retractor or an emergency-locking retractor, the webbing and retractor shall be subjected to a tensile force of  $2,500 \pm 25$  pounds or  $1,135 \pm 10$  kilograms with the webbing fully extended from the retractor.

(7) If a seat belt assembly has a buckle in which the tongue is capable of inverted insertion, one of the three assemblies shall be tested with the tongue inverted.

(b) *Type 2 seat belt assembly.* Components of three seat belt assemblies shall be tested in the following manner:

(1) The pelvic restraint between anchorages shall be adjusted to a length between 48 and 50 inches or 122 and 127 centimeters, or as near this length as possible if the design of the pelvic restraint does not permit its adjustment to this length. An automatic-locking or emergency-locking retractor when included in a seat belt assembly shall be locked at the start of the test with a tension on the webbing slightly in excess of the retractive force in order to keep the retractor locked. The attachment hardware shall be oriented to the webbing as specified in paragraph (a) (2) of this section and illustrated in Figure 5. A tensile force of  $2,500 \pm 25$  pounds or  $1,135 \pm 10$  kilograms shall be applied on the components in any convenient manner and the extension between anchorages under this force shall be measured. The force shall be reduced to  $75 \pm 5$  pounds

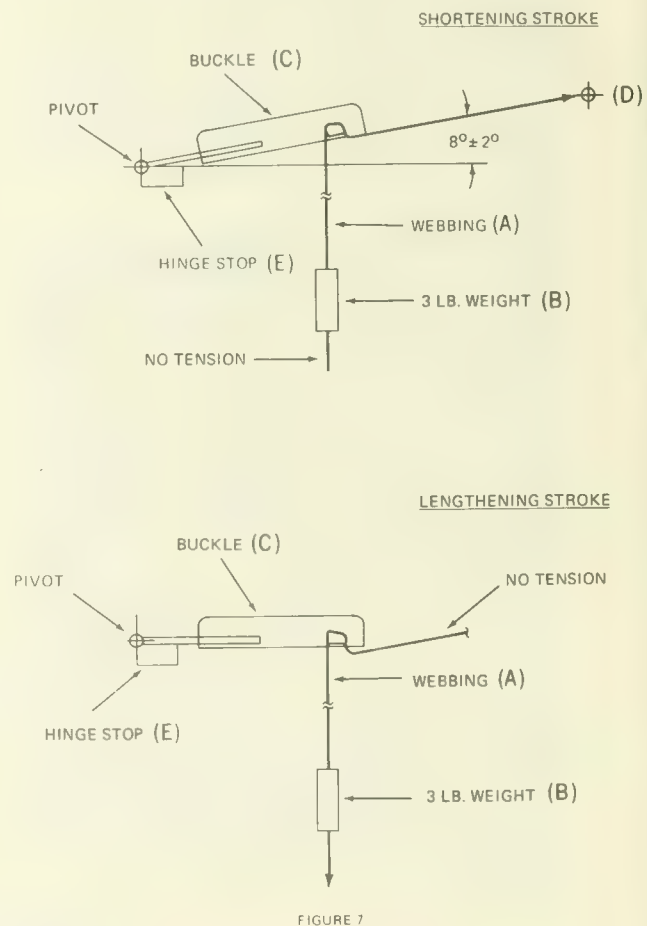


FIGURE 7

or  $34 \pm 2$  kilograms and the buckle release force measured as prescribed in S5.2(d).

(2) The components of the upper-torso restraint shall be subjected to a tensile force of  $1,500 \pm 15$  pounds or  $680 \pm 5$  kilograms following the procedure prescribed above for testing pelvic restraint and the extension between anchorages under this force shall be measured. If the testing apparatus permits, the pelvic and upper-torso restraints may be tested simultaneously. The force shall be reduced to  $75 \pm 5$  pounds or  $34 \pm 2$  kilograms and the buckle release force measured as prescribed in S5.2(d).

(3) Any component of the seat belt assembly common to both pelvic and upper-torso restraint shall be subjected to a tensile force of  $3,000 \pm 30$  pounds or  $1,360 \pm 15$  kilograms.

(4) After the buckle is released in tests of pelvic and upper-torso restraints, the webbing shall be examined for cutting by the hardware. If the yarns are partially or completely severed in a line for a distance of 10 percent or more of the webbing width, the cut webbing shall be tested for breaking strength as specified in S5.1(b) locating the cut in the free length between grips. If there is insufficient webbing on either side of the cut to make such a test for breaking strength, another seat belt assembly shall be used with the webbing repositioned in the hardware. The force applied shall be  $2,500 \pm 25$  pounds or  $1,135 \pm 10$  kilograms for components of pelvic restraint, and  $1,500 \pm 15$  pounds or  $680 \pm 5$  kilograms for components of upper-torso restraint. After the force is removed, the breaking strength of the cut webbing shall be determined as prescribed above.

(5) If a Type 2 seat belt assembly includes an automatic-locking retractor or an emergency-locking retractor, the webbing and retractor shall be subjected to a tensile force of  $2,500 \pm 25$  pounds or  $1,135 \pm 10$  kilograms with the webbing fully extended from the retractor, or to a tensile force of  $1,500 \pm 15$  pounds or  $680 \pm 5$  kilograms with the webbing fully extended from the retractor if the design of the assembly permits only upper-torso restraint forces on the retractor.

(6) If a seat belt assembly has a buckle in which the tongue is capable of inverted insertion, one of the three assemblies shall be tested with the tongue inverted.

(c) *Resistance to buckle abrasion.* Seatbelt assemblies shall be tested for resistance to abrasion by each buckle or manual adjusting device normally used to adjust the size of the assembly. The webbing of the assembly to be used in this test shall be exposed for 4 hours to an atmosphere having relative humidity of 65 percent and temperature of  $70^\circ$  F. The webbing shall be pulled back and forth through the buckle or manual adjusting device as shown schematically in Figure 7. The anchor end of the webbing (A) shall be attached to a weight (B) of 3 pounds. The webbing shall pass through the buckle (C), and the other end (D) shall be attached to a reciprocating device so that the webbing forms an angle of  $8^\circ$  with the hinge stop (E). The reciprocating device shall be operated for 2,500 cycles at a rate of 18 cycles per minute with a stroke length of 8 inches. The abraded webbing shall be tested for breaking strength by the procedure described in paragraph S5.1(b).

44 F.R. 72131  
December 13, 1979





# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 210**

## **Seat Belt Assembly Anchorages—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses**

**(Docket No. 2-14; Notice No. 4)**

An amendment to Motor Vehicle Safety Standard No. 210, Seat Belt Assembly Anchorages, was published on October 1, 1970 (35 F.R. 15293). Thereafter, pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119), petitions for reconsideration were filed by Rolls Royce, Ltd., International Harvester Co., Chrysler Corp., Ford Motor Co., General Motors Corp., the Automobile Manufacturers Association, Toyota Motor Co., Ltd., American Motors, Jeep Corp., Chrysler United Kingdom, Ltd., and Checker Motors Corp.

In response to information contained in the petitions, and other considerations, certain requirements of the standard are hereby amended and the effective date of the standard with respect to passenger cars is postponed until January 1, 1972. The petitions for relief from certain other requirements of the standard are denied.

1. The effective date of the amended standard with respect to passenger cars was to have been January 1, 1971. Each petitioner claimed to be unable to produce vehicles conforming to the amended standard by that date. Those who provided lead time information indicated that several months would be needed, with estimates ranging from March 31, 1971, for Rolls Royce, to January 1, 1972, for a number of manufacturers. A January 1972 effective date would have the advantage of coinciding with the effective date proposed for the closely related interim standard on occupant crash protection (Docket 69-7, Notice 6, 35 F.R. 14941). Since the amendments with respect to passenger cars are intended primarily to enhance the enforceability of the standard rather than to provide new levels of safety, it

has been determined that good cause has been shown for establishing an effective date for passenger cars of January 1, 1972.

With a single exception, the requests for postponement of the effective date of the standard with respect to multipurpose passenger vehicles, trucks, and buses, are denied. One of the primary reasons for amending the standard was to extend the protection afforded by seat belts to occupants of these types of vehicles. A postponement of effective date would leave these vehicles completely without anchorage requirements for an additional 6 months. Although manufacturers who have been installing anchorages may find it necessary to reexamine the strength and location of their anchorages, this is not considered a sufficient ground for postponing the effective date.

International Harvester requested a postponement until January 1, 1972, in the date on which upper torso restraint anchorages will be required on seats other than front seats in multipurpose passenger vehicles. On consideration of the lead time difficulties that have been demonstrated by this manufacturer, the Director regards the request as reasonable and has decided to grant the requested postponement.

2. A number of petitions requested reconsideration of the sections dealing with anchorage location. Section S4.3.1.4 of the standard states that "Anchorages for an individual seat belt assembly shall be located at least 13.75 inches apart laterally for outboard seats and at least 6.75 inches apart laterally for other seats."

General Motors stated that several of its vehicles have anchorages for the center seating position that are 6.50 inches apart, that some of

the anchorages for outboard seats are less than 13.75 inches apart, and that there is no basis either for setting a minimum spacing, or for setting different minimum spacings for different seating positions. Similar comments were made by AMA, Chrysler, Ford and American Motors.

As originally issued, Standard No. 210 had required anchorages to be "as near as practicable, 15 inches apart laterally." To make the standard more precise and more easily enforceable, the notice of September 20, 1969 (34 F.R. 14658), proposed to delete the qualifying language and to require that anchorages be 15 inches apart laterally. The comments indicated that anchorages for center seating positions, particularly the front positions, would require complete relocation. The available data on the effects of anchorage spacing were not regarded as conclusive enough to justify imposing this burden on the manufacturers, and the spacing for anchorages for inboard locations was accordingly reduced to 6.75 inches in the amended standard. Without clearer biomechanical data, the intent was to adopt the prevailing industry minimum as the standard. The same rationale applied to outboard seating position, where the 15-inch spacing was reduced to 13.75 inches.

It now appears that both spacing employed in the amended standard failed to reflect prevailing locations. The Director is accordingly amending section S4.3.1.4 to establish a minimum spacing of 6.50 inches.

A further problem with the spacing requirement arises from the use of "anchorage" as the reference point for measurement. As long as the standard used the qualifying language "as near as practicable," there was no difficulty. Removal of that phrase by the notice of September 20, 1969, created a problem of interpretation that escaped comment until after issuance of the amended standard. Several petitioners commented that they do not know what point to use for measurement. The director concedes the deficiency, and accordingly amends section S4.3.1.4 to specify that the spacing is "measured between the vertical centerlines of the bolt holes."

In conjunction with its request for a reduction of the spacing requirement, General Motors stated that where structural members between the

anchorage and the seating position have the effect of spreading the seat belt loop apart, the spacing should be measured between the widest contact points on the structure. Since the strength of these structural members is not regulated, there is no assurance that their performance in a crash will be equal to that of properly spaced anchorages. The request offers no improvement in occupant crash protection, and may, in fact, diminish such protection. The request is therefore denied.

3. The amended standard's other location requirements concern the placement of anchorages to achieve desirable seat belt angles. Sections S4.3.1.1 and S4.3.1.3 each use the "nearest belt contact point on the anchorage" as the lower point defining the line whose angle is to be measured. Several petitions expressed uncertainty as to the point described, and on reconsideration the Director agrees that clarification is needed.

In the notice of proposed rule making that preceded the amended standard (34 F.R. 14658, Sept. 20, 1969) the line had been run to the "anchorage". This usage lacked precision, as stated by several comments. In an attempt to define a line that would closely approximate the actual belt angle, the language in question was adopted. The problem lies in the use of the word "anchorage", since in most installations the belt does not actually contact the anchorage. The point intended was, in fact, the nearest contact point of the belt webbing with the hardware that attaches it to the anchorage. In the typical installation, this point would be on an angle plate bolted to the anchorage. Sections S4.3.1.1 and S4.3.1.3 are accordingly amended to use the phrase "the nearest contact point of the belt with the hardware attaching it to the anchorage."

4. The test procedures of S5.1 and S5.2 were the subject of several requests for reconsideration. Most petitioners stated that the test was not representative of crash conditions, and several suggested that it should be displaced by a dynamic test. Times suggested for such a dynamic test ranged from 0.1 second to 1.0 second, and were said to be the tests used by the petitioners, or by one or another of the international standards organizations. The requirement for a 10-second hold period at maximum



load attracted the most strongly adverse comment.

From its inception, Standard No. 210 has contemplated a static test. The notice of proposed rule making of September 20, 1969, proposed a test that was clearly static, in that it involved a slow rate of load application (2 to 4 inches per minute). In response to comments that the rate was too slow, and to avoid problems of interpretation as to where the rate of pull was to be measured, the procedures were amended to specify the rate of load application in time rather than distance, with the full load reached in a period of from 0.1 to 30 seconds. It should be noted that the vehicle must be capable of meeting the requirements when tested at any rate within this range. To insure that the basic strength of the structure would be measured whatever the shape of the load application curve, a hold period of 10 seconds was specified. The procedures of the amended standard do no more than give more specific form to the test contemplated in the original standard.

The postponement of the effective date of the amended standard will provide additional time for passenger car manufacturers to assure themselves of compliance with the standard. After consideration of the issues raised in the petitions for reconsideration, the Director has concluded that the tests prescribed by the standard are reasonable, practicable, and appropriate for the affected motor vehicles. The petitions for reconsideration of sections S5.1 and S5.2 are therefore denied.

5. Two petitioners, Rolls Royce and General Motors, stated that it was not practicable to use the "seat back" in determining the angle of the torso line in S4.3.2, in that the seat back angle may vary according to which of its surfaces is measured. Although there may be instances where the angle of the seat back is difficult to determine, questions arising from such instances can be resolved, if necessary, by administrative interpretation, and it has been decided to retain the reference to "seat back" in section S4.3.2.

6. Several petitioners stated that the substitution of the word "device" for "provision" in the definition of seat belt anchorage appeared to change the meaning of that term. No substan-

tive change was intended, and since the rewording has caused some misunderstanding, the Director has decided to return to the original wording.

7. General Motors also petitioned to reinstate the provision in section S4.3.2 that would allow the upper torso restraint angle to be measured from the shoulder to the anchorage "or to a structure between the shoulder point and the anchorage". The phrase rendered uncertain the effective angle of the belt under stress. The quoted language was deleted in the notice of September 20, 1969, and no sufficient reason has been given for reinstating it. The request is therefore denied.

8. Toyota Motor Co. requested that sections S5.1 and S5.2 be amended to allow use of body blocks equivalent to those specified. Although the standard provides that an anchorage must meet the strength requirements when tested with the specified blocks, manufacturers may use whatever methods they wish to ascertain that their products meet these requirements when so tested, as long as their methods constitute due care. If the Toyota procedures are, in fact, equivalent, there is no need to amend the standard to accommodate them. The request is therefore denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 210, in § 571.21 of Title 49, Code of Federal Regulations is amended. . . .

*Effective date.* For the reasons given above, it has been determined that the effective date of the amended standard shall be January 1, 1972, for passenger cars. The effective date for multipurpose passenger vehicles, trucks, and buses shall be July 1, 1971, except that the effective date for installation of anchorages for upper torso restraints for seating positions other than front outboard designated seating positions shall be January 1, 1972.

Issued on November 20, 1970.

Charles H. Hartman,  
Acting Director.

35 F.R. 18116  
Nov. 26, 1970



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 210

### Seat Belt Assembly Anchorages and Seat Belt Installations; Reconsideration and Amendment (Docket No. 2-14; Notice No. 4)

The purpose of this notice is to amend Motor Vehicle Safety Standards No. 208 and 210, with respect to the installation of shoulder belts in multipurpose passenger vehicles exceeding 10,000 pounds GVWR and the provision of anchorages for shoulder belts in vehicles other than passenger cars.

The seat belt installation standard was amended on September 30, 1970, to require installation of seat belts in multipurpose passenger vehicles, trucks, and buses manufactured after July 1, 1971 (35 F.R. 15222). Exemptions from the requirement for shoulder belt installation were provided for certain types and weights of vehicles.

During the course of the subsequent rulemaking activity which led to the issuance of the occupant crash protection standard, it was determined that the larger weight classes of trucks and multipurpose passenger vehicles should not be required to install shoulder belts (35 F.R. 14941, 35 F.R. 16937, 36 F.R. 4600). The standard therefore required lap belts, but not shoulder belts, for vehicles over 10,000 pounds GVWR, effective January 1, 1972. The September 30 amendment, which is to become effective six months earlier than the occupant crash protection rule, had provided a similar exemption for large trucks but not for multipurpose passenger vehicles, with the result that shoulder belts would have been required for many large multipurpose passenger vehicles during the period July 1, 1971-January 1, 1972, but not afterward. To correct this inconsistency, the seat belt installation standard is amended, effective July 1, 1971, to exempt multipurpose passenger vehicles of more than

10,000 pounds GVWR from the shoulder belt requirement.

In accordance with the foregoing, section S3.1 of Standard No. 208, as published September 30, 1970 (35 F.R. 15222) is amended effective July 1, 1971 . . . .

Standard No. 210, *Seat Belt Assembly Anchorages*, presently requires vehicles other than passenger cars to have shoulder belt anchorages installed at front outboard seating positions by July 1, 1971, and at rear outboard seating positions by January 1, 1972 (35 F.R. 15293, 35 F.R. 18116, 36 F.R. 4291). The Recreational Vehicle Institute has petitioned for an amendment of the standard, to delete the requirement for shoulder belt anchorages at positions where shoulder belt installation is not required by Standard No. 208.

It has been found that this petition has merit. The probability of shoulder belt installation by the owners of these vehicles is very small, and the difficulty of anchorage installation, particularly in multipurpose passenger vehicles, is often greater than in passenger cars. The amendment is therefore considered to be in the public interest.

The request by RVI for a postponement of the July 1, 1971, effective date for installation of shoulder belt anchorages has not been found justified, and the petition is in that respect denied.

In accordance with the foregoing, section S4.1.1 of the present Motor Vehicle Safety Standard No. 210 (effective July 1, 1971), and the amended Standard No. 210 as published November 26, 1970 (35 F.R. 18116, effective January 1, 1972), in 49 CFR 571.21, are both amended . . . .



**Effective: July 1, 1971**  
**January 1, 1972**

The effective dates of the amendments made by this notice are as indicated above. Because the amendments relieve restrictions and impose no additional burden on any person, notice and request for comments on such notice are found to

be unnecessary, and it is found, for good cause shown, that an effective date earlier than 180 days after issuance is in the public interest.

**36 F.R. 9869**  
**May 29, 1971**

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 210

### Seat Belt Anchorages

(Docket No. 72-23; Notice 3)

This notice amends Safety Standard No. 210, *Seat Belt Assembly Anchorages*, to eliminate the "buckle cutout" as an optional configuration of the body block test device used for testing the strength of lap-shoulder belt anchorages, and to clarify the illustration (Figure 2) of body blocks used for testing lap belt anchorages. The optional configuration is being deleted because it unnecessarily complicates the test of the anchorages and is no longer being used by manufacturers.

Effective Date: May 18, 1978.

#### For Further Information Contact:

William E. Smith, Division of Crashworthiness, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242).

Supplementary Information: Standard No. 210 (49 CFR 571.210) requires seat belt anchorages in motor vehicles to comply with specified strength requirements. The procedure for strength testing is set forth in paragraph S5 of the standard. The tests involve the attachment of a seat belt to the anchorage, followed by the application of force to the seat belt which is thereby transferred to the anchorage itself. Force is applied to Type 1 and Type 2 seat belt assemblies through body blocks that simulate the human torso. The body blocks are illustrated in Figures 2 and 3 of the standard. This notice modifies Figures 2 and 3 in accordance with the notice of proposed rulemaking issued December 16, 1976 (41 F.R. 54050).

Figure 2 describes the body block used for lap belt anchorage testing, and there has been some confusion concerning certain minor specifications in the Figure. This amendment modifies the

drawing in Figure 2 to clarify the description of the body block. The change does not affect the substantive requirements of the standard in any way.

Figure 3 describes the body block used for combination shoulder and lap belt anchorage testing. An optional "buckle cutout" is shown on the surface of the body block in Figure 3, permitting a manufacturer to make an indentation in the face of the body block to accommodate buckle hardware. NHTSA compliance test experience with the cutout demonstrates that the edge of the cutout causes additional stress on the belt webbing and interferes with its movement, thereby interfering with the test of the underlying anchorage. Comments to the proposal favored deletion of the "buckle cutout" option since it is disadvantageous to manufacturers and is no longer being utilized. This amendment, therefore, deletes the optional cutout from Figure 3.

General Motors' comment recommended additional modifications of the drawing in Figure 2. The agency has determined, however, that the suggestion to add shading to define the area of the body block to be covered by foam padding does not significantly alter the clarity of the drawing. General Motors also recommended a substitute test device for the lap-shoulder belt body block. This recommendation will possibly be considered in future rulemaking.

The engineer and lawyer primarily responsible for the development of this notice are William Smith and Hugh Oates, respectively.

Since this amendment does not make any substantive change in the requirements of the standard, it is found that an immediate effective date is in the public interest.

**Effective: May 18, 1978**

In consideration of the foregoing, Standard  
No. 210, 49 CFR 571.210, is amended . . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15  
U.S.C. 1392, 1407); delegation of authority at  
49 CFR 1.50).

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Issued on May 15, 1978.

Joan Claybrook  
Administrator

**43 F.R. 21892**  
**May 23, 1978**



## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE STANDARD NO. 210**

### **Seat Belt Assembly Anchorages**

**(Docket No. 72-23; Notice 5)**

*Action:* Final rule.

*Summary:* This notice amends Safety Standard No. 210, *Seat Belt Assembly Anchorages*, to eliminate the anchorage location requirements for passive seat belt assemblies that meet the frontal crash protection requirements of Safety Standard No. 208. The purpose of the amendment is to give manufacturers wider latitude in passive belt design in order to facilitate the early introduction of passive restraints in existing passenger car designs. The amendment will allow manufacturers to experiment with various passive belt designs to help determine the optimum relationship between anchorage location and passive belt effectiveness in a variety of crash modes and their comfort and convenience. Anchorage location would still be indirectly controlled by the necessity for passive belts to comply with the Standard No. 208 requirements.

*Effective date:* November 16, 1978.

*Addresses:* Petitions for reconsideration should refer to the docket number and notice number and be submitted to: Docket Section, Room 5108—Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

*For further information contact:*

William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590  
(202) 426-2242.

*Supplementary information:* Safety Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR 571.210), specifies zones and acceptable ranges within which seat belt anchorages must be located to ensure that the anchorages are in the proper location for effective occupant restraint and specifies strength requirements to

reduce the likelihood of their failure in a crash. In response to a petition from General Motors Corporation, the NHTSA issued a proposal to delete these anchorage location requirements for passive belt systems that meet the dynamic frontal crash protection requirements of Safety Standard No. 208 (43 FR 22419, May 25, 1978).

The proposal noted that General Motors would like to use a passive belt design whose anchorages, in some vehicles, would lie outside the parameters specified in the standard. GM stated that the anchorage locations of this design are intended to ensure the comfort and convenience of the passive belt so that it will not be disconnected by vehicle users who find current active belts lacking in these qualities. General Motors wanted to introduce this passive belt design prior to the effective date of the passive restraint requirements issued July 5, 1977 (42 FR 34289). As stated in the preamble of the proposal, the agency has determined manufacturers should be given wide latitude in passive belt design in order to facilitate the early introduction of passive systems, since they should save many lives and prevent hundreds to thousands of injuries. Although the current anchorage location requirements were developed primarily for active belt systems, passive belt systems such as the one used on the Volkswagen Rabbit have successfully complied with the anchorage location requirements and met the frontal injury criteria of Standard No. 208 as well. Nonetheless, manufacturers have said they can develop more effective and comfortable passive systems to comply with Standard 208. The agency thinks they should be given the opportunity. Nevertheless, it is the agency's view that research should be conducted to determine the optimum anchorage locations for the various passive belt designs in terms of both passive belt

effectiveness and of comfort and convenience for vehicle occupants. Accordingly, the earlier notice proposed the deletion of the anchorage requirements for passive belts until appropriate requirements for these systems can be developed and incorporated in the standard.

Comments in support of the proposed change were received from Chrysler, British Leyland, American Motors, Ford, Volkswagen, General Motors, and the Association Peugeot-Renault. These commenters argued that manufacturers should not be restricted in passive belt design, so that manufacturers can determine which designs are the most effective and at the same time acceptable to the public. The Center for Auto Safety argued against the proposal, however, stating that elimination of the anchorage location requirements may degrade available occupant protection.

The Center for Auto Safety agreed that manufacturers should be allowed flexibility in passive belt design to facilitate the early introduction of passive restraints. However, it argued that elimination of the forward boundary for upper torso belt anchorages may "(1) seriously degrade occupant protection available by allowing the anchorages to be installed in areas likely to be struck by the occupant in a side impact and (2) may result in systems that do not sufficiently restrain the occupant from submarining or moving laterally under the belt." The Center's first concern is that side-impact head injuries will increase if passive belt retractors, buckles, and other hardware are permitted in areas likely to be struck by the occupant's head in a side collision. The comment noted that vehicles equipped with passive belts are not required to meet the lateral impact requirements of Standard No. 208 and that manufacturers would, therefore, have no incentive to design anchorages and other hardware to avoid injuries in non-frontal collisions.

The Center's second concern is that elimination of the anchorage location requirements will allow passive belt designs that lead to more lateral occupant movement and "submarining" in side crashes, thereby increasing side impact injuries. The Center also argued that it should be the responsibility of General Motors to demonstrate the safety consequences of moving passive belt anchorages outside the current range require-

ments, before the agency eliminates the requirements for passive belts. Finally, the Center is concerned that once the exemption is allowed, it might be years before new location requirements for passive belts are specified.

Regarding the Center's first concern, the present requirements do not prohibit the placement of hardware in areas where they could be struck by an occupant's head in a side collision. While manufacturers may not be constrained by present standards from placing hardware where it poses a danger to occupants in side impacts, all manufacturers are on notice that the agency is preparing to propose a side impact standard as delineated in the agency's rulemaking plan. Thus, in anticipation of the upgraded side impact requirements, manufacturers should design their passive belt systems in such a way that they will not compromise side impact protection.

The Center's concern about the potential for increased lateral movement and submarining in side crashes was not supported by any data. The NHTSA is also concerned about side impact injuries. However, the existing location requirements for belt anchorages were not specifically designed to address the problem of lateral occupant motion in non-frontal collisions where the occupant is restrained by a single, diagonal passive upper torso restraint used with a knee bolster.

The notice of proposed rulemaking explicitly stated that the NHTSA intends to issue separate anchorage location requirements for passive belts following research to determine the optimum locations for passive belt effectiveness, comfort and convenience, and that the proposed exemption from the current requirements is only an interim measure. The NHTSA intends to conduct studies to look at the change in injury data resulting from displacement of the upper anchorage point of a single diagonal belt for various sizes of occupants. The research program includes testing that will investigate the "submarining" problem and, during frontal oblique impact simulations, the likelihood of excessive lateral movement. The agency will consider simulated side impact testing during this research program to evaluate potential degradation of occupant protection in this crash mode. The agency will also consider anchorage location dur-

ing the upgrading of side impact protection requirements. As stated in the recent "Five Year Rulemaking Plan," the improvement of occupant protection in side impacts is one of the NHTSA's highest priorities.

The Center's suggestion that GM demonstrate the safety consequences of passive belt anchorages should be addressed by the NHTSA's intention to look with great care at manufacturers' compliance testing of all passive belt designs to assure that these new systems will, in fact, provide at least the level of overall protection now afforded by conventional restraint systems.

Finally, regarding the Center's concern that new location requirements for passive belt anchorages will not be specified for many years, the notice of proposed rulemaking and this notice make it clear that the exemption is only an interim measure to allow improvements in passive belt designs. It is consistent, however, with the attempt to make FMVSS 208 a performance standard to the greatest extent possible. Nevertheless, should any manufacturer produce passive belt hardware or systems that cause or exacerbate injuries that would not occur with active systems currently in production, the NHTSA's safety defect authority would permit the agency to investigate such systems for possible recall and correction. Manufacturers are hereby put on notice of that fact.

In summary, the NHTSA has concluded that manufacturers should be given wide latitude in passive belt design in order to aid the early introduction of passive restraints and to aid the de-

velopment of optimum designs in terms of both effectiveness and comfort and convenience. The agency agrees that anchorage location requirements are important for passive belts, but believes that more effective requirements can be developed following further research specifically involving passive belts. To ensure that safe and effective systems are being developed, the agency will be testing many of the new passive systems that will come on the market prior to the 1982 model year. In addition, the agency intends to ask manufacturers to supply data concerning the performance of passive systems in both compliance crash testing and in sled and crash testing in other modes.

The NHTSA has determined that this amendment will have no economic or environmental consequences.

The engineer and lawyer primarily responsible for the development of this notice are William Smith and Hugh Oates, respectively.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR 571.210), is amended . . . .

**AUTHORITY:** (Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 3, 1978.

Joan Claybrook  
Administrator

**43 F.R. 53440**  
**November 16, 1978**





## MOTOR VEHICLE SAFETY STANDARD NO. 210

### Seat Belt Assembly Anchorages—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

Docket No. 2-14; Notice No. 4)

**S1. Purpose and scope.** This standard establishes requirements for seat belt assembly anchorages to insure their proper location for effective occupant restraint and to reduce the likelihood of their failure.

**S2. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

**S3. Definition.** "Seat belt anchorage" means the provision for transferring seat belt assembly loads to the vehicle structure.

#### **S4. Requirements.**

##### **S4.1 Type.**

**S4.1.1** Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each forward-facing outboard designated seating position in passenger cars, other than convertibles and for each designated seating position for which a Type 2 seat belt assembly is required by Standard No. 208 in vehicles other than passenger car.

**S4.1.2** Seat belt anchorages for a Type 1 or a Type 2 seat belt assembly shall be installed for each designated seating position, except a passenger seat in a bus or a designated seating position for which seat belt anchorages for a Type 2 seat belt assembly are required by S4.1.1.

##### **S4.2 Strength.**

**S4.2.1** Except for side-facing seats, the anchorage for a Type 1 seat belt assembly or the pelvic portion of a Type 2 seat belt assembly shall withstand a 5,000-pound force when tested in accordance with S5.1.

**S4.2.2** The anchorage for a Type 2 seat belt assembly shall withstand 3,000-pound forces when tested in accordance with S5.2.

**S4.2.3** Permanent deformation or rupture of a seat belt anchorage or its surrounding area is not considered to be a failure, if the required force is sustained for the specified time.

**S4.2.4** Except for common seat belt anchorages for forward-facing and rearward-facing seats, floor-mounted seat belt anchorages for adjacent designated seating positions shall be tested by simultaneously loading the seat belt assemblies attached to those anchorages.

**S4.3 Location.** As used in this section, "forward" means in the direction in which the seat faces, and other directional references are to be interpreted accordingly.

**S4.3.1 Seat belt anchorages for Type 1 seat belt assemblies and the pelvic portion of Type 2 seat belt assemblies.**

**S4.3.1.1** In an installation in which the seat belt does not bear upon the seat frame, a line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage for a nonadjustable seat, or from a point 2.50 inches forward of and 0.375 inch above the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage for an adjustable seat in its rearmost position, shall extend forward from the anchorage at an angle with the horizontal of not less than 20° and not more than 75°.

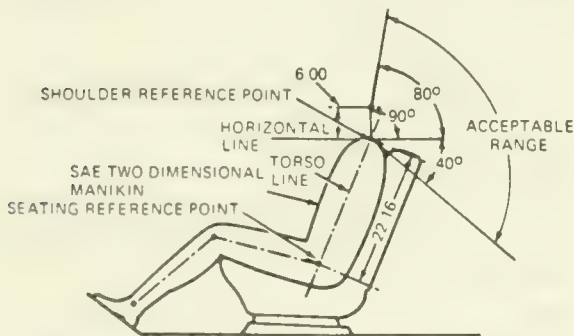
**S4.3.1.2** In an installation in which the belt bears upon the seat frame, the seat belt anchorage, if not on the seat structure, shall be aft of the rearmost belt contact point on the seat frame with the seat in the rearmost position. The line from the seating reference point to the nearest belt contact point on the seat frame shall extend

forward from that contact point at an angle with the horizontal of not less than 20° and not more than 75°.

**S4.3.1.3** In an installation in which the seat belt anchorage is on the seat structure, the line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from that contact point at an angle with the horizontal of not less than 20° and not more than 75°.

**S4.3.1.4** Anchorages for an individual seat belt assembly shall be located at least 6.50 inches apart laterally, measured between the vertical centerlines of the bolt holes.

**S4.3.2 Seat belt anchorages for the upper torso portion of Type 2 seat belt assemblies.** With the seat in its full rearward and downward position and the seat back in its most upright position, the seat belt anchorage for the upper end of the upper torso restraint shall be located within the acceptable range shown in Figure 1, with refer-



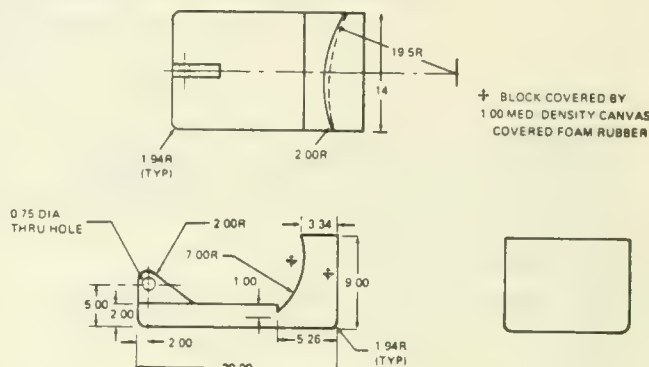
**FIGURE 1** LOCATION OF ANCHORAGE FOR UPPER TORSO RESTRAINT

ence to a two-dimensional manikin described in SAE Standard J826 (November 1962) whose "H" point is at the seating reference point and whose torso line is at the same angle from the vertical as the seat back.

**S5. Test procedures.** Each vehicle shall meet the requirements of S4.2 when tested according to the following procedures. Where a range of values is specified, the vehicle shall be able to meet the requirements at all points within the range.

**S5.1 Seats with Type 1 or Type 2 seat belt anchorages.** With the seat in its rearmost position, apply a force of 5,000 pounds in the direction in which the seat faces to a pelvic body block as described in Figure 2, restrained by a

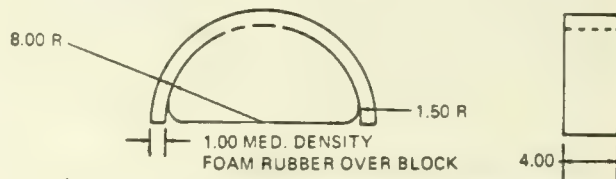
Type 1 or the pelvic portion of a Type 2 seat belt assembly, as applicable, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5° nor more than 15° above the horizontal. Apply the force at the onset rate of not more than 50,000 pounds per second. Attain the 5,000-pound force in not more than 30 seconds and maintain it for 10 seconds.



**FIGURE 2** BODY BLOCK FOR LAP BELT ANCHORAGE

## S5.2 Seats with Type 2 seat belt anchorages.

With the seat in its rearmost position, apply forces of 3,000 pounds in the direction in which the seat faces simultaneously to pelvic and upper torso body blocks as described in Figures 2 and 3, restrained by a Type 2 seat belt assembly, in



**FIGURE 3** BODY BLOCK FOR COMBINATION SHOULDER AND LAP BELT ANCHORAGE

a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5° nor more than 15° above the horizontal. Apply the forces at the onset rate of not more than 30,000 pounds per second. Attain the 3,000-pound forces in not more than 30 seconds and maintain them for 10 seconds.

**35 F.R. 18116  
November 26, 1970**



## MOTOR VEHICLE SAFETY STANDARD NO. 211

### Wheel Nuts, Wheel Discs, and Hub Caps—Passenger Cars and Multipurpose Passenger Vehicles

**S1. Purpose and scope.** This standard precludes the use of wheel nuts, wheel discs, and hub caps that constitute a hazard to pedestrians and cyclists.

**S2. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, and passenger cars and multipurpose passenger vehicle equipment.

**S3. Requirements.** Wheel nuts, hub caps, and wheel discs for use on passenger cars and multipurpose passenger vehicles shall not incorporate winged projections.

“wheel nuts, hub caps, and wheel discs for use on passenger cars and multipurpose passenger vehicles shall not incorporate winged projections.” A “wheel nut” is an exposed nut that is mounted at the center or hub of a wheel, and not the ordinary small hexagonal nut, one of several which secures a wheel to an axle, and which is normally covered by a hub cap or wheel disc.

Issued on July 22, 1969.

F. C. Turner  
Federal Highway Administrator

#### INTERPRETATION

A clarification of the term “wheel nut” as used in the requirements section S3 of Standard No. 211 has been requested. This section states that

32 F.R. 2416  
February 3, 1967



**PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 212****Windshield Mounting—Passenger Cars**

A proposal to amend Part 371 of the Federal Motor Vehicle Safety Standards by adding a Standard No. 212, Windshield Mounting—Passenger Cars, was published as an advance notice of proposed rule making on October 14, 1967 (32 F.R. 14281) and a notice of proposed rule making on December 28, 1967 (32 F.R. 20866).

Interested persons have been given the opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

This new standard requires that, when tested as prescribed, each passenger car windshield mounting must retain either: (1) not less than 75% of the windshield periphery; or (2) not less than 50% of that portion of the windshield periphery on each side of the vehicle longitudinal centerline, if an unrestrained 95th percentile adult male manikin is seated in each outboard front seating position.

Several comments objected to the proposed standard and in some cases urged that more research should be done before any type of windshield mounting is required. The standard, is however, part of an integrated program aimed at accomplishing the widely accepted safety goal of keeping occupants within the confines of the passenger compartment during a crash. One major step in this program is the utilization of the laminated glazing material prescribed in Federal motor vehicle safety standard No. 205, which has resulted in a marked reduction in serious head injury to occupants known to have struck the windshield. The windshield mounting retention requirement prescribed in this standard takes advantage of this improved glazing material and will further minimize the likelihood

of occupants being thrown from the vehicle during a crash.

Several comments requested reduction of the 75% retention requirement to 50%. The Administrator concludes that, as an alternative, 50% retention is acceptable if: (1) an unrestrained 95% percentile adult male manikin is seated in each outboard front seating position when the test procedure is performed, and (2) at least 50% of that portion of the windshield periphery on each side of the vehicle longitudinal centerline is retained.

Several comments requested that the phrase "or approved equivalent" be added to the "Demonstration procedures" provision. § 371.11 of the Federal motor vehicle safety standards provides that "an approved equivalent may be substituted for any required destructive demonstration procedure." Consequently, inclusion of the phrase requested is not necessary.

In consideration of the foregoing, § 371.21, of Part 371 of the Federal motor vehicle safety standards is amended by adding Standard No. 212, "Windshield Mounting—Passenger Cars," as set forth below, effective January 1, 1970.

This rule-making action is taken under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (P.L. 89-563, 15 U.S.C. §§ 1392 and 1407) and the delegation of authority contained in Part 1 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 1).

Issued in Washington, D.C. on August 13, 1968.

John R. Jamieson, Deputy  
Federal Highway Administrator

**33 F.R. 11652**  
**August 16, 1968**





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 212

### Windshield Mounting

(Docket No. 69-29; Notice 5)

This notice amends Motor Vehicle Safety Standard No. 212, 49 CFR 571.212, *Windshield Mounting*, to extend its applicability to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating (GVWR) of 10,000 pounds or less, except for forward control vehicles and open-body type vehicles with folding or removable windshields, and to coordinate its test procedures with those of Standard No. 208, 49 CFR 571.208, *Occupant Crash Protection*.

An advance notice of proposal rulemaking was published September 16, 1969 (34 FR 14438), followed by notices of proposed rulemaking published on August 23, 1972 (37 FR 16979) and January 18, 1974 (39 FR 2274). This notice is based on the latter notice of proposed rulemaking, and responds to the comments submitted thereto.

The final rule retains the proposed rule's extension to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating (GVWR) of 10,000 pounds or less. However, forward control vehicles and open-body vehicles with fold-down windshields are excluded from the application of the standard because of the impracticability of complying with the requirements.

Many manufacturers objected to the requirement in the proposal that the dummies used in the test vehicle not be restrained by active restraint systems. Upon impact in a crash test, unrestrained dummies tend to fly about the passenger compartment, damaging the dummies.

In 1972 the NHTSA proposed the amendment of Standard No. 212 (37 FR 16979) to specify a 75 percent retention requirement using restrained dummies. The purpose of the proposal was to eliminate optional retention requirements

and to permit dynamic testing consistent with other safety standards. In 1974 another approach was taken with the NHTSA proposing (39 FR 2274) a 50 percent retention requirement using unrestrained dummies, in anticipation of the passive restraint requirements that were to be included in Standard No. 208. Having the benefit of a large number of comments on both proposals the NHTSA has determined that both are suitable, the 1972 approach for vehicles equipped with active restraints, where dummy damage would be great if the dummy were unrestrained, and the 1974 approach for vehicles equipped with passive restraints, since the dummy would not contact the windshield.

The frontal barrier crash test conditions specified in the final rule are substantially similar to those of Standard No. 208, *Occupant Crash Protection*, Standard No. 219, *Windshield Zone Intrusion*, and Standard No. 301, *Fuel System Integrity*. This will allow compliance testing for these standards in one crash test under certain circumstances. In this way, much of the expense associated with crash testing can be reduced.

Most of the manufacturers who commented on the proposal objected to the requirement that the vehicle be tested at a temperature range of 15° F to 110° F. Some manufacturers objected that the higher temperatures would damage sensitive instrumentation. Others argued that the range should be coordinated with that of Standard No. 301 (49 CFR 571.301) or with ISO regulations. Some asserted that they would have to build expensive test facilities in order to conduct tests at the temperature extremes. The NHTSA has determined that testing over the specified range is necessary, in light of the fact that wind-

Effective: September 1, 1977

shield moldings have significantly different retention capabilities at different temperatures. The NHTSA recognizes that certain additional expenses may be entailed in testing over the specified temperature range. However, the safety need to ensure adequate wind-shield retention justifies the additional expense.

In consideration of the foregoing, Standard No. 212, 49 CFR 571.212, is amended to read as set forth below.

*Effective date:* September 1, 1977.

(Sec. 103, 119, Pub. L. 89563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on: August 23, 1976.

John W. Snow  
Administrator

**41 F.R. 36493**  
**August 30, 1976**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 212****Windshield Mounting****(Docket No. 69-29; Notice 6)**

This notice responds to nine petitions for reconsideration of a recent amendment (41 FR 36493, August 30, 1976) of Safety Standard No. 212, *Windshield Mounting*, by extending the effective date of the amendment from September 1, 1977, to September 1, 1978, and by excluding "walk-in van-type" vehicles from the standard's applicability. Other aspects of the petitions for reconsideration are denied.

**Dates:** The amendment of August 30, 1976, will be effective September 1, 1978. The change in the effective date and the amendment to exclude "walk-in van-type" vehicles from the standard's applicability should be changed in the text of the Code of Federal Regulations, effective August 4, 1977.

**For Further Information Contact:**

Robert Nelson  
National Highway Traffic Safety Administration  
Washington, D.C. 20590  
(202 426-2802)

**Supplementary Information:** Safety Standard No. 212, *Windshield Mounting* (49 CFR Part 571.212), was amended August 30, 1976, to modify the performance requirements and test procedures of the standard and to extend the standard's applicability to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating of 10,000 pounds or less. Petitions for reconsideration were received from International Harvester (IH), Jeep Corporation, American Motors Corporation (AMC), Volvo of America Corporation, Toyo Kogyo Co., General Motors Corporation (GM), Rolls Royce Motors, Nissan Motor Co. Ltd., and Leyland Cars.

Requests from some of these petitioners that the new provisions of Standard No. 212 (49

CFR 571.212) be withdrawn entirely are hereby denied, but several modifications are undertaken by the National Highway Traffic Safety Administration (NHTSA), based on a review of the information and arguments submitted.

Nearly all of the petitioners requested that the effective date of the new provisions be changed from September 1, 1977, to September 1, 1978. Petitioners argued that a lead time of one year will be insufficient to accomplish design changes and retooling necessary to adapt passenger-car windshield technology to other vehicle types. Petitioners also pointed out that the specification of a temperature range in the test conditions will require manufacturers to undertake more extensive certification testing than in the past.

The NHTSA has determined that the requests for additional lead time are justified in light of the information submitted regarding design changes that some manufacturers will undertake. The petitions are, therefore, granted in part and the effective date of the new provisions is postponed to September 1, 1978.

In conformity with the agency's 1972 and 1974 proposals (37 FR 16979, August 23, 1972) (39 FR 2274, January 18, 1974), an optional means of meeting the retention requirement (that exists in the present provisions) was eliminated by the August 30, 1976, amendments. This was done to reduce the amount of necessary compliance testing and to encourage "simultaneous" certification testing of separate standards where practicable. As proposed in 1972, the "75-percent alternative" (retention of 75 percent of the windshield periphery—dummies properly restrained) was made mandatory for all vehicles not equipped with passive restraints. In this way, windshield retention tests could be per-

formed at the same time as tests already required for fuel system integrity (49 CFR 571.301-75) that specify restrained dummies.

While some additional weight is added to the vehicle by the required dummies, it is the minimum necessary to permit "simultaneous" testing, and the dummies are restrained so that there is only incidental, if any, contact with the windshield. Thus, the "75-percent alternative" specified in the amendments is, basically, a continuation of the existing requirement that manufacturers have been meeting for years.

The 1974 proposal to adopt the "50-percent option" (retention of 50 percent of the windshield periphery on each side of the windshield—dummies unrestrained) was vigorously objected to by manufacturers because of the damage that could occur to dummies during impact with the windshield. Also, the fuel system integrity standard was made final in a form that required restraining the dummies by safety belts if provided. It was apparent that the "50-percent option" should only become mandatory as proposed for vehicles equipped with passive restraint systems that could protect the dummy against impact damage. In the case of air cushion restraint systems, of course, some contact with the windshield by the cushion or incidental contact by the dummy is expected during the crash test. For this reason, the somewhat less stringent "50-percent option" was made final for vehicles equipped with passive restraints.

AMC argued that this distinction between vehicles is unjustified. The only reason put forward by AMC was that "dummy impact is not a critical factor in determining windshield retention." This reason does not, however, support the AMC request for a reduction in retention performance from the 75-percent level presently being met. Rather, it argues for an increase in the 50-percent level established for those vehicles in which the NHTSA estimated that dummy and restraint contact could affect results. If AMC believes that the distinction is not justified, the agency will review further evidence to increase the 50-percent requirement (for passive-equipped vehicles) to the 75-percent level presently being met in most of today's passenger cars.

Several commenters objected that the final rule differed in some respects from the 1972 and 1974 proposals to amend Standard No. 212, taken separately. AMC, Volvo, and Jeep petitioned to revoke the separate retention requirements for vehicles with different restraint systems, on the grounds that such a distinction had never been proposed. Jeep Corporation also objected to extension of the standard's applicability to MPV's, trucks, and buses because of variations in language from the proposals.

As earlier noted, the requirement for 75-percent retention conforms to the 1972 proposal. The only variation from the 1972 proposal was to implement the performance levels proposed in 1974 for the vehicles that might be equipped with passive restraints. It is the agency's view that "a description of the subjects and issues involved" in the rulemaking action was published in the Federal Register as required by the Administrative Procedure Act (the Act) (5 U.S.C. § 553(b)(2)), permitting opportunity for comment by interested persons. A reading of the cases on this provision of the Act supports the agency's view.

Volvo's petition objected to the fact that the amendments specify the use of restrained dummies in the test procedures. Volvo stated that unrestrained dummies should be used because in actual crash conditions it is the head of an unrestrained occupant that is most likely to impact and substantially load the windshield, since the head of a restrained occupant would not normally contact the windshield.

While Volvo's statement is true, it must be understood that test procedures specified in the standards cannot simulate every element of actual crash conditions. Rather, the procedures are based on a variety of considerations, including test expense and degree of complexity. There were many comments to the prior notices proposing the amendments in question that urged the use of restrained dummies, due to the possibility of damage to the expensive dummies during the barrier crash tests. These comments were taken into consideration prior to issuance of the final rule. Also, the NHTSA concluded that the vehicle deceleration forces are the primary forces affecting windshield retention and



not the impact of occupants with the windshield. The restrained dummies are required, primarily, for purposes of permitting simultaneous testing. The NHTSA concludes that the retention requirements and test procedures specified in the amendments will ensure that vehicles are equipped with windshields that provide the needed protection for occupant safety.

Volvo's petition also argued that Standard No. 212 "must include a measurement procedure that weights the various segments of the windshield periphery in a technically accurate manner." Volvo points to tests it has conducted which indicate that "when the unrestrained occupant's head impacts and substantially loads the windshield, the loading will most likely occur in the windshield's upper regions and *not* uniformly throughout the windshield."

While it is recognized that the degree of dislodging of the windshield from its mounting may vary at different locations around the periphery of the windshield, sufficient information is not available on which to base varying retention requirements (for different areas of the windshield). Further, the specification of retention requirements in the terms suggested by Volvo was not proposed by the agency in 1972 or 1974. This aspect of Volvo's petition is therefore denied.

Several petitioners objected to the specification of a temperature range in the test conditions and asked that this provision be withdrawn. Rolls Royce Motors argued that the amendment will require additional tests to determine the most critical temperature for windshield retention and stated that this would greatly increase the burden on low-volume manufacturers. General Motors and Jeep Corporation stated that the expansion of the test requirements over a wide temperature range adds to the stringency of the standard without any evidence of a safety need. American Motors petitioned to remove the 15°F to 110°F temperature range from the barrier test conditions on the basis that "it was not specified as a barrier test condition in the proposal for rulemaking," and on the basis that there are laboratory tests that can serve the same purpose.

The NHTSA denies all petitions to withdraw the temperature range from the standard. As

stated in the preamble to the final rule, testing over the specified range is necessary in light of the fact that windshield moldings have significantly different retention capabilities at different temperatures. This fact was graphically confirmed by NHTSA compliance testing in which windshields retained at low temperatures were dislodged at higher temperatures (in identical vehicles). Concerning the objection of American Motors, the temperature range was proposed in paragraph S4 of the 1974 proposal to amend Standard No. 212 (39 FR 2274).

General Motors recommended that the temperature range be revised to specify 66°F to 78°F limits, to coordinate the Standard 212 test with the calibration conditions for the Part 572 dummy. General Motors argued that this would reduce the number of barrier crash tests that would be required.

The NHTSA rejects this recommendation. The Part 572 dummies are conditioned in the 66°F–78°F temperature range for calibration purposes in those standards in which the dynamic dummy response is part of the requirements of the standard. Since the response of the dummy is not directly involved in the performance requirements of Standard No. 212, the temperature of the dummies is not significant. Therefore, it is not necessary to restrict the temperature range of Standard No. 212 to correspond to the calibration temperature range of the Part 572 dummies. For purposes of simultaneous testing, manufacturers could devise a means to control the immediate environment of the test dummy within the 66°F–78°F calibration temperature range, independent of the temperature range specified in Standard No. 212.

General Motors also argued that there could be considerable variation in vehicles condition and test results, depending on when and where the vehicle is tested, since there could be an air temperature of 110°F while windshield components are at a much higher temperature due to "sun load." General Motors, therefore, requested that the temperature requirement be clarified to specify that the temperature of the entire vehicle be stabilized between 15°F and 110°F prior to the test.

The NHTSA does not intend that vehicles be tested with the windshield components at tem-



peratures higher than 110 F. For purposes of clarification, paragraph S6.5 of the new provisions is revised to specify that the windshield mounting material, and all vehicle components in direct contact with the mounting material are to be at any temperature between 15 F and 110°F. Presumably this could be accomplished by localized heating or cooling of the vehicle components or by any other method chosen, in the exercise of due care, by a manufacturer.

The August 1976 amendments to Standard No. 212 modified the application section to include multipurpose passenger vehicles, trucks and buses having a gross weight rating of 10,000 pounds or less. "Open-body type" vehicles and "forward control" vehicles were excluded because of the impracticability of applying the barrier crash test to these vehicles. General Motors has pointed out that the NHTSA failed to exclude "walk-in van-type" vehicles, which have essentially the same configuration and amount of front-end crush space as forward control vehicles.

The NHTSA recently addressed this same issue in connection with Standard No. 219,

*Windshield Zone Intrusion*, and, in the absence of any objections, amend that standard to exclude walk-in van-type vehicles (41 FR 54945, December 16, 1976). On reconsideration of the extended applicability of Standard No. 212 to these vehicles, the agency concludes that the same rationale applies. Accordingly, applicability of Standard No. 212 to walk-in van-type vehicles is withdrawn.

In consideration of the foregoing, the effective date of the amendment to Standard No. 212 (49 CFR 571.212) published August 30, 1976 (41 FR 36493) is changed from September 1, 1977, to September 1, 1978, and paragraphs S3 and S6.5 of that text are modified. . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 29, 1977.

Joan Claybrook  
Administrator

**42 F.R. 34288**  
**July 5, 1977**

# PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 212

## Windshield Mounting; Windshield Zone Intrusion

(Docket No. 79-14; Notice 02)

**ACTION:** Final Rule.

**SUMMARY:** This notice amends two safety standards, Standard No. 212, *Windshield Mounting*, and Standard No. 219, *Windshield Zone Intrusion*, to limit the maximum unloaded vehicle weight at which vehicles must be tested for compliance with these standards. This action is being taken in response to petitions from the Truck Body and Equipment Association and the National Truck Equipment Association asking the agency to amend the standards to provide relief from some of the test requirements for final-stage manufacturers. Many of these small manufacturers do not have the sophisticated test devices of major vehicle manufacturers. The agency concludes that the weights at which vehicles are tested can be lessened while providing an adequate level of safety for vehicles such as light trucks and while ensuring that compliance with these standards does not increase their aggressivity with respect to smaller vehicles.

**EFFECTIVE DATE:** Since this amendment relieves a restriction by easing the existing test procedure and will not impose any additional burdens upon any manufacturer, it is effective (upon publication).

**FOR FURTHER INFORMATION CONTACT:**

Mr. William Smith, Crashworthiness Division,  
National Highway Traffic Safety Administration,  
400 Seventh Street, S.W.,  
Washington, D.C. 20590 (202-426-2242)

**SUPPLEMENTARY INFORMATION:**

On August 2, 1979, the National Highway Traffic Safety Administration published a notice of proposed rulemaking (44 FR 45426) relating to two safety standards: Standard Nos. 212, *Windshield*

*Mounting*, and 219 *Windshield Zone Intrusion*. That notice proposed two options for amending the test procedures of the standards that were designed to ease the compliance burdens of small final-stage manufacturers.

The agency issued the proposal after learning that final-stage manufacturers were frequently unable to certify certain vehicles in compliance with these two safety standards. The problem arises because of weight and center of gravity restrictions imposed upon the final-stage manufacturer by the incomplete vehicle manufacturer. (The final-stage manufacturer typically purchases an incomplete vehicle from an incomplete vehicle manufacturer, usually Ford, General Motors or Chrysler.) The incomplete vehicle usually includes the windshield and mounting but does not include any body or work-performing equipment. Since the incomplete vehicle manufacturer installs the windshield, it represents to the final-stage manufacturer that the windshield will comply with the two subject safety standards. In making this representation, however, the incomplete vehicle manufacturer states that the representation is contingent on the final-stage manufacturer's adherence to certain restrictions. Any final-stage manufacturer that does not adhere to the restrictions imposed by the incomplete vehicle manufacturer must recertify the vehicle based upon its own information, analysis, or tests. The major restrictions imposed by the incomplete vehicle manufacturers on the final-stage manufacturer involve weight and center of gravity limitation. In many instances, these limitations have made it impossible for final-stage manufacturers either to rely on the incomplete vehicle manufacturer's certification or to complete vehicles on the same chassis that they were accustomed to using (prior to the extension of the two safety standards to these vehicle types). As a result, the final-stage manufacturer is faced either with buying

the same chassis as before and recertifying them or with buying more expensive chassis with higher GVWR's and less stringent weight and center of gravity limitations.

The agency has tried several different ways to alleviate this problem for the final-stage manufacturer. The NHTSA has met with representatives of the major incomplete vehicle manufacturers to encourage them to respond voluntarily by strengthening their windshield structures and reducing the restrictions that they currently impose upon final-stage manufacturers. The agency also discussed the possibility of its mandating these actions by upgrading Standards Nos. 212 and 219. Ford and General Motors indicated that the making of any major changes in these standards could lead to their deciding to discontinue offering chassis for use in the manufacturing of multi-stage vehicles. They said that such chassis were a very small percentage of their light truck sales and that, therefore, they would not consider it worth the cost to them to make any extensive modifications in their vehicles. NHTSA also asked the incomplete vehicle manufacturers to be sure that they have properly certified their existing vehicles and that they are not imposing unnecessarily restrictive limitations upon final-stage manufacturers. To this agency's knowledge, these vehicle manufacturers have neither undertaken any strengthening of their vehicles' windshield structures nor lessened any of their restrictions.

At the same time that the agency was made aware of the final-stage manufacturers' problems of certifying to these standards, the agency was becoming concerned about the possibility that compliance of some light trucks and vans with these standards might have made the vehicles more aggressive with respect to smaller passenger cars that they might impact. According to agency information, if these standards require a substantial strengthening of vehicle frames, the aggressivity of the vehicles is increased. Therefore, as a result of the agency's concern about aggressivity and its desire to address the certification problems of final-stage manufacturers in a manner that would not lead to a cessation of a chassis sales to those manufacturers, the agency issued the August 1979 proposal. The agency hoped that the proposal would allow and encourage incomplete vehicle manufacturers to reduce their

weight and center of gravity restrictions, thereby easing or eliminating the compliance test burdens of final-stage manufacturers. The agency believed that this could occur using either option, because either would result in vehicles being tested at lower weights. Currently vehicles are tested under both standards at their unloaded vehicle weights plus 300 pounds.

The first option would have required some vehicles whose unloaded vehicle weights exceeded 4,000 pounds to be tested by being impacted with a 4,000 pound moving barrier. The second option proposed by the agency would have required vehicles to be tested at their unloaded vehicle weight up to a maximum unloaded vehicle weight of 5,500 pounds. This option was suggested to the agency by several manufacturers and manufacturer representatives.

#### Comments on Notice

In response to the agency's notice, nine manufacturers and manufacturer representatives submitted comments. All of the commenters supported some action in response to the problems of final-stage manufacturers. Most of the commenters also suggested that the agency's second alternative solution was more likely to achieve reductions in the restrictions being imposed by incomplete vehicle manufacturers. The first option would have created a new, unproven test procedure, and manufacturers would have been cautious in easing center of gravity or weight restrictions based upon this test procedure. Accordingly, most commenters were not sure that the first option would achieve the desired results. The consensus was, therefore, that the second option should be adopted.

Some manufacturers recommended that both options be permitted allowing the manufacturer to decide how to test its vehicles. The agency does not agree with this recommendation. Not only would it be more difficult and expensive to enforce a standard that has alternative test procedures, but most manufacturers prefer the 5,500 pound weight limit option. The NHTSA concludes that as a result of the comments supporting the 5,500 pound maximum test weight, that this is an acceptable procedure for testing compliance with these two standards. Therefore, the standards are amended to incorporate this procedure.



The major incomplete vehicle manufacturers commenting on the notice suggested that testing vehicles at a maximum weight of 5,500 pounds might provide some immediate relief. None of the major incomplete vehicle manufacturers provided any information concerning how substantial that relief might be. Ford indicated that any relief might be limited.

The agency believes that the incomplete vehicle manufacturers must accept the responsibility for establishing reasonable restrictions upon their incomplete vehicles. The NHTSA has not been provided with sufficient evidence substantiating the statements of the incomplete vehicle manufacturers that their existing restrictions are reasonable. In fact, some evidence indicates that unnecessarily stringent restrictions are being imposed because incomplete vehicle manufacturers do not want to conduct the necessary testing to establish the appropriate weight and center of gravity restrictions. Since this amendment should reduce the severity of the test procedures, the agency concludes that incomplete vehicle manufacturers should immediately review their certification test procedures and reduce the restrictions being passed on to final-stage manufacturers.

Due to changes in the light truck market, there is reason to believe that the incomplete vehicle manufacturers will be more cooperative than when the agency spoke to them before beginning this rulemaking. At that time, light truck sales were still running well. Now that these sales are down, these manufacturers may be more solicitous of the needs of the final-stage manufacturers. If relief is not provided by the incomplete vehicle manufacturers, then the agency will consider taking additional steps, including the upgrading of Standards Nos. 212 and 219 as they apply to all light trucks.

General Motors (GM) questioned one of the agency's rationales for issuing the notice of proposed rulemaking. GM stated that the agency concludes that this action will provide a more appropriate level of safety for the affected vehicles while the initial extension of these standards to the affected vehicles provides, in GM's view, only a slight increase in the level of safety of the vehicles. GM indicates that since the application of these standards to the affected vehicles provides only slight benefits and since this amendment will

reduce those benefits, the standards should not apply to light trucks and vans. The agency disagrees with this suggestion.

The agency is currently reviewing the applicability of many of its safety standards to determine whether they ought to be extended to light trucks and other vehicles. Accident data clearly indicate the benefits that have resulted from the implementation of safety standards to cars. The fatality rate for passenger cars has decreased substantially since the implementation of a broad range of safety standards to those vehicles. On the other hand, light trucks and vans have not had a corresponding reduction in fatality rates over the years. The agency attributes much of this to the fact that many safety standards have not been applied to those vehicles. Since those vehicles are becoming increasingly popular as passenger vehicles, the agency concludes that safety standards must apply to them.

In response to GM's comment that this reduction in the test requirements for Standard Nos. 212 and 219 will remove all benefits derived by having the standards apply to those vehicles, the agency concludes that GM has misinterpreted the effects of this amendment. This amendment will reduce somewhat the compliance test requirements for those light trucks and vans with unloaded vehicle weights in excess of 5,500 pounds. It will not affect light trucks with unloaded vehicle weights below 5,500 pounds. According to agency information, approximately 25 percent of the light trucks have unloaded vehicle weights in excess of 5,500 while the remainder fall below that weight. As a result of weight reduction to improve fuel economy, it is likely that even more light trucks will fall below the 5,500 pound maximum test weight in the future. Therefore, this amendment will have no impact upon most light trucks and vans. In light of the small proportion of light trucks and vans affected by this amendment and considering the potential benefits of applying these standards to all light trucks and vans, the agency declines to adopt GM's suggestion that the standards be made inapplicable to these vehicles.

With respect to GM's question about the appropriate level of safety for light trucks, the agency's statement in the notice of proposed rulemaking was intended to show that the safety of light trucks and vans cannot be viewed without considering the relative safety of lighter vehicles

that they may impact. Accordingly, the level of safety that the agency seeks to achieve by this and other safety standards is determined by balancing the interests of the occupants of passenger cars and heavier vehicles.

GM also questioned the agency's statement that vehicle aggressivity may be increased by imposing too severe requirements on these vehicles. GM suggested that no evidence exists that vehicle aggressivity is increased as a result of complying with these standards.

The agency stated in the proposal that it was concerned that compliance with the standards as they now exist might have increased the aggressivity of the vehicles, thereby harming the occupants of passenger cars that are impacted by these larger, more rigid vehicles. The agency is now beginning to examine the full range of vehicle aggressivity problems. The docket for this notice contains a paper recently presented by a member of our staff to the Society of Automotive Engineers on this subject. The agency tentatively concludes, based upon the initial results of our research and analysis, that vehicle aggressivity could be a safety problem and that the agency considers that possibility in issuing its safety standards. The NHTSA notes that Volkswagen applauds the agency's recognition of the vehicle aggressivity factor in safety.

As to GM's argument that compliance with the standards may not have increased vehicle aggressivity, our information on this point came from the manufacturers. The manufacturers indicated that compliance with Standards 212 and 219 requires strengthening the vehicle frame. This makes a vehicle more rigid. Our analysis indicates that making a vehicle more rigid may also make it more aggressive. Therefore, the agency concludes partially on the basis of the manufacturer's information, that compliance with the safety standards as they are written may have increased the aggressivity of the vehicles.

Ford Motor Company suggested that, rather than change these two particular standards, the agency should amend the certification regulation (Part 568) to state that any vehicle that is barrier tested would be required only to comply to an unloaded vehicle weight of 5,500 pounds or less. Ford suggested that this would standardize all of the tests and provide uniformity.

The agency is unable to accept Ford's recommendation for several reasons. First, the certification regulation is an inappropriate place to put a test requirement applicable to several standards. The tests' requirements of the standards should be found in each standard. Second, the Ford recommendation would result in a reduction of the level of safety currently imposed by Standard No. 301, *Fuel System Integrity*.

As we stated earlier and in several other notices, the agency is legislatively forbidden to modify Standard No. 301 in a way that would reduce the level of safety now required by that standard. Even without this legislative mandate, the agency would not be likely to relieve the burdens imposed by Standard No. 301. That standard is extremely important for the prevention of fires during crashes. Compliance of a vehicle with this standard not only protects the occupants of the vehicle that is in compliance but also protects the occupants of vehicles that it impacts. The agency concludes that the standard now provides a satisfactory level of safety in vehicles, and NHTSA would not be likely to amend it to reduce these safety benefits even if such an amendment were possible.

With respect to fuel system integrity, several manufacturers suggested that the agency had underestimated the impact of that standard upon weight and center of gravity restrictions. These commenters indicated that compliance with that standard requires more than merely adding shielding to the fuel systems of the vehicles. The agency is aware that compliance with that standard in certain instances has imposed restrictions upon manufacturers. Nonetheless, the agency continues to believe that as a result of this amendment, the chassis manufacturers will be able to reduce their weight and center of gravity restrictions while still maintaining the compliance of their vehicles with Standard No. 301.

Chrysler commented that the agency should consider including the new test procedure in Standard No. 204 and all other standards that require barrier testing. The agency has issued a notice on Standard No. 204 (44 FR 68470) stating that it was considering a similar test provision for that standard. The agency also is aware that any barrier test requirement imposed upon vehicles subject to substantial modifications by final-stage



manufacturers will create problems for the final-stage manufacturers. Accordingly, the agency will consider the special problems of these manufacturers prior to the issuance of standards that might affect them and will attempt to make the test requirements of the various standards consistent wherever possible.

The agency has reviewed this amendment in accordance with Executive Order 12044 and concludes that it will have no significant economic or other impact. Since the regulation relieves some testing requirements, it may slightly reduce costs associated with some vehicles. Accordingly, the agency concludes that this is not a significant amendment and a regulatory analysis is not required.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations Part 571 is

amended by adding the following sentence to the end of paragraph S6.1(b) of Standard No. 212 (49 CFR 571.212) and paragraph S7.7(b) of Standard No. 219 (49 CFR 571.219).

Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds.

The authors of this notice are William Smith of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

Issued on March 28, 1980.

Joan Claybrook  
Administrator

**45 F.R. 22044**  
**April 3, 1980**





## MOTOR VEHICLE SAFETY STANDARD NO. 212

### Windshield Mounting

**S1. Scope.** This standard establishes windshield retention requirements for motor vehicles during crashes.

**S2. Purpose.** The purpose of this standard is to reduce crash injuries and fatalities by providing for retention of the vehicle windshield during a crash, thereby utilizing fully the penetration-resistance and injury-avoidance properties of the windshield glazing material and preventing the ejection of occupants from the vehicle.

**S3. Application.** This standard applies to passenger cars and to multipurpose passenger vehicles, trucks, and buses having a gross vehicle weight rating of 10,000 pounds or less. However, it does not apply to forward control vehicles, walk-in van-type vehicles, or to open-body-type vehicles with fold-down or removable windshields.

**S4. Definition.** "Passive restraint system" means a system meeting the occupant crash protection requirements of S5 of Standard No. 208 by means that require no action by vehicle occupants.

**S5. Requirements.** When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, under the conditions of S6, the windshield mounting of the vehicle shall retain not less than the minimum portion of the windshield periphery specified in S5.1 and S5.2.

#### **S5.1 Vehicles equipped with passive restraints.**

Vehicles equipped with passive restraint systems shall retain not less than 50 percent of the portion of the windshield periphery on each side of the vehicle longitudinal centerline.

**S5.2 Vehicles not equipped with passive restraints.** Vehicles not equipped with passive restraint systems shall retain not less than 75 percent of the windshield periphery.

**S6. Test conditions.** The requirements of S5 shall be met under the following conditions:

**S6.1** The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S6.2, a passenger car is loaded to its unloaded vehicle weight plus its cargo and luggage capacity weight, secured in the luggage area, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position.

(b) Except as specified in S6.2, a multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight plus 300 pounds or its rated cargo and luggage capacity, whichever is less, secured to the vehicle, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position. The load is distributed so that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the weight on any axle when the vehicle is loaded to its unloaded vehicle weight plus dummy weight exceeds the axle's proportional share of the test weight, the remaining weight is placed so that the weight on that axle remains the same. For the purposes of this section, unloaded vehicle weight does not include the weight of workperforming accessories. Vehicles are tested to a maximum unloaded vehicle weight of 5,500 pounds.

**S6.2** The fuel tank is filled to any level from 90 to 95 percent of capacity.

**S6.3** The parking brake is disengaged and the transmission is in neutral.

**S6.4** Tires are inflated to the vehicle manufacturer's specifications.

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**S6.5** The windshield mounting material and all vehicle components in direct contact with the mounting material are at any temperature between 15°F and 110°F.

**41 F.R. 36493**  
**August 30, 1976**



## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 213

### Child Restraint Systems, Seat Belt Assemblies, and Anchorages

(Docket No. 74-9; Notice 6)

**ACTION:** Final rule.

**SUMMARY:** This rule establishes a new Standard No. 213, *Child Restraint Systems*, which applies to all types of child restraints used in motor vehicles. It also upgrades existing child restraint performance requirements by setting new performance criteria and by replacing the current static tests with dynamic sled tests that simulate vehicle crashes and use anthropomorphic child test dummies. The new standard would reduce the number of children under 5 years of age killed or injured in motor vehicle accidents.

**DATES:** On June 1, 1980, compliance with the requirements of this standard will become mandatory. The current Standard No. 213 is amended to permit, at the manufacturer's option, compliance during the interim period either with the requirements of existing Standard No. 213, *Child Seating Systems*, or the new Standard No. 213, *Child Restraint Systems*.

**ADDRESSES:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590

**FOR FURTHER INFORMATION CONTACT:**

Mr. Vladislav Radovich, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:**

This notice establishes a new Standard No. 213, *Child Restraint Systems*. A notice of proposed rulemaking was published on May 18, 1978 (43 FR 21470) proposing to upgrade and extend the

applicability of the existing Standard No. 213, *Child Seating Systems*. The existing standard does not regulate car beds and infant carriers and uses static testing to assess the effectiveness of child restraint systems. The new standard covers all types of child restraint systems and evaluates their performance in dynamic sled tests with anthropomorphic test dummies. On May 18, 1978, NHTSA also published a companion notice of proposed rulemaking proposing to amend Part 572, *Anthropomorphic Test Dummies*, by specifying requirements for two anthropomorphic test dummies representing 3 year and 6 month old children (43 FR 21490) for use in compliance testing under proposed Standard No. 213. The comment closing date for both notices was December 1, 1978.

At the request of the Juvenile Product Manufacturers Association, NHTSA extended the comment closing date until January 5, 1979, for the portions of both proposals dealing with testing with the child test dummies. This extension was granted because manufacturers were reportedly having problems obtaining the proposed test dummies to conduct their own evaluations.

Consumers, public health organizations, child restraint manufacturers and others submitted comments on the proposed standard. The final rule is based on a thorough evaluation of all data obtained in NHTSA testing, data submitted in the comments, and data obtained from other pertinent documents and test reports. Significant comments submitted to the docket are addressed below. The agency will soon issue a final rule on the anthropomorphic test dummy proposal.

**Summary of the Final Rule Provisions**

The significant portions of the new standard are as follows:

1. The performance of the child restraint system is evaluated in dynamic tests under conditions

simulating a frontal crash of an average automobile at 30 mph. The restraint system is anchored with a lap belt and, if provided with the restraint, a supplementary anchorage belt (tether strap). An additional frontal impact test at 20 mph is conducted for restraints equipped with tether straps or arm rests. In that additional test, child restraints with tether straps will be tested with the tether straps detached and child restraints with arm rests will be tested with the arm rest in place but with the child restraint system belts unbuckled. The additional 20 mph tests are intended to ensure a minimum level of safety performance when the restraints are improperly used.

2. To protect the child, limitations are set on the amount of force exerted on the head and chest of the child test dummy during the dynamic testing of restraints specified for children over 20 pounds. Limitations are also set on the amount of frontal head and knee excursions experienced by the test dummy in forward-facing child restraints and harnesses. To prevent a child from being ejected from a rearward-facing restraint, limitations are set on the amount the seat can tip forward and on the amount of excursion experienced by the test dummy during the simulated crash.

3. During the dynamic testing, no load-bearing or other structural part of any child restraint system shall separate so as to create jagged edges that could injure a child. If the restraint has adjustable positions, it must remain in its pre-test adjusted position during the testing so that the restraint does not shift positions in a crash and possibly injure a child's limbs caught between the shifting parts or allow a child to submarine during the crash (i.e., allow the child's body to slide too far forward and downward, legs first).

4. To prevent injuries to children during crashes from contact with the surface of the restraint, requirements for the size and shape are specified for those surfaces. In addition, protective padding requirements are set for restraints used by children weighing 20 pounds or less.

5. Requirements in Standard No. 209, *Seat Belt Assemblies* (49 CFR 571.209), are applied to the belt restraints used in child restraint systems.

6. The amount of force necessary to open belt buckles and release a child from a restraint system is specified so that children cannot unbuckle themselves, but adults can easily open the buckle.

7. To promote the easy and correct use of all child restraint systems, they are required to attach to the vehicle by means of vehicle seat belts.

8. Warnings for proper use of the restraints must be permanently posted on the restraint so that the warnings are visible when the restraint is installed. Other information, such as the height and weight limits for children using the child restraint, must also be permanently displayed on the restraint but it does not have to be visible when the restraint is installed. The restraint must also have a location for storing an accompanying information booklet or sheet on how to correctly install and use the restraint.

9. A standard seat assembly is used in the dynamic testing to represent the typical vehicle bench seat and thereby avoid the cost of testing child restraints on numerous vehicle seats.

#### **Applicability of Standard No. 213**

The provisions of new Standard No. 213 apply to all types of child restraints used in motor vehicles for protection of children weighing up to 50 pounds, such as child seats, infant carriers, child harnesses and car beds. Beginning on June 1, 1980, compliance with the requirements of this standard will become mandatory. The current Standard No. 213 is amended to permit, at the manufacturer's option, compliance during the interim period either with the requirements of existing Standard No. 213, *Child Seating Systems*, or of the new Standard No. 213, *Child Restraint Systems*.

#### **Dynamic Testing**

The requirements to be met in the dynamic testing of child restraints include: maintaining the structural integrity of the system, retaining the head and knees of the dummy within specified excursion limits (i.e., limits on how far those portions of the body may move forward) and limiting the forces exerted on the dummy by the restraint system. These requirements will reduce the likelihood that the child using a child restraint system will be injured by the collapse or disintegration of the system, or by contact with interior of the vehicle, or by imposition of intolerable forces by the restraint system. As explained below, omission of any of these three requirements would render incomplete the criteria for the quantitative assessment of the safety of a child restraint system



and could very well lead to the design and use of unsafe restraints.

It was suggested in comments by the child restraint manufacturers and their trade association, the Juvenile Products Manufacturers Association (JPMA), that available restraints are performing satisfactorily. According to them, the new standard imposes expensive testing requirements with instrumented dummies which will increase the price of child restraints and discourage the purchasing of child restraints because of their increased costs. Many manufacturers suggested that the agency limit the standard to tests for occupant excursion and restraint system structural integrity in dynamic tests and not require the use of instrumented test dummies to measure crash forces imposed upon a child.

NHTSA recognizes that some child restraints perform relatively well, but the agency's testing has shown that others perform unsatisfactorily. Measuring only the structural integrity of the system and the amount of occupant excursion allowed during the testing does not provide a measurement of the severity of forces imposed on a child during a crash and thus does not provide an accurate assessment of the actual safety of the system. For example, a manufacturer could design a restraint with a surface mounted in front of the child that would allow a small amount of occupant excursion. However, that surface could impose potentially injurious forces on a child. NHTSA believes that the force measurement performance requirements are a crucial and necessary test to adequately judge a restraint system's effectiveness in preventing or reducing injuries. The use of instrumented test dummies and force measurement requirements are crucial elements of Standard No. 208, *Occupant Crash Protection*, which establish performance requirements for automatic restraint systems. NHTSA believes that systems designed specifically for children should have to provide the same high degree of occupant protection.

Several manufacturers (GM, Ford, Questor, and others) and JPMA objected to the proposed head and chest acceleration limits that must not be exceeded in the dynamic testing. They argued that the acceleration limits are based on biomechanical data for adults and there are no data showing their applicability to children. Because of the lack of biomechanical data on children's tolerance to impact forces, NHTSA has conducted tests of child

restraints with live primates to serve as surrogates for three-year-old children. Primates are similar in certain respects to children and, have been used by GM, Ford and others as surrogates in child restraint testing to assess potential injuries to children in crashes. In simulated 30 mph crashes conducted for NHTSA, similar to the test prescribed in the proposed standard, the primates either were not injured or sustained only minor injuries. NHTSA has also conducted child restraint tests using instrumented test dummies representing three-year-old children instead of primates. In the tests, the forces measured on the test dummies, which had not been injurious to the primates, did not exceed the head and chest acceleration criteria proposed in the standard. NHTSA is thus confident that the child restraints which do not exceed these performance criteria in the prescribed tests should prevent or reduce injuries to children in crashes.

Use of instrumented test dummies should not unduly raise the price of child restraints. Since many child restraint systems are already close to compliance, the cost per restraint of any needed design and testing costs should be minimal.

The May 1978 notice would have required restraint systems with adjustable positions to meet the performance requirements of the standards in any of its adjusted positions recommended for use in a motor vehicle. The restraint would have had to remain in its adjusted position during testing. International Manufacturing Co. requested the agency to test adjustable restraints in only their extreme up and down positions. If a manufacturer chooses to offer a seat with a number of adjustable positions which it recommends for use in a motor vehicle, it is important that the seat meet the performance requirements of the standard at any of those positions. Therefore, International's request is denied. NHTSA urges manufacturers not to include any adjustment positions for their restraints which are not to be used in a motor vehicle.

Strollee, Questor and Volvo asked NHTSA to allow adjustable position restraints to change positions during the testing, arguing that controlled change of position can be an effective energy-absorbing method. Allowing changes from one adjustment position to another during a crash can cause injuries to children's hands or fingers caught between the structural elements of the restraint as



it changes position. Other effective energy-absorbing methods are available which will not pose a risk of injury to children. Thus, NHTSA is not adopting this suggestion.

Child restraint manufacturers and other interested parties, such as Action for Child Transportation Safety (ACTS), American Academy of Pediatrics, Physicians for Automotive Safety, and Michigan's Office of Highway Safety, urged NHTSA to lengthen the 30 inch head and knee excursion requirements for forward-facing restraints. They argued that some child restraint systems which have been effective in real world crashes will exceed the proposed head excursion limit. NHTSA has reviewed its child restraint tests and determined that during the last few inches of excursion the remaining velocity of the head in impacts with padded surfaces is relatively low. Because slightly increasing the head excursion should not increase the forces imposed upon the child's head, the head excursion limit is changed from 30 to 32 inches.

The May 1978 notice proposed limiting the amount of knee excursion in forward-facing child restraints to 30 inches. The purpose of the knee excursion limit is to prevent manufacturers from controlling the amount of head excursion by designing their restraints so that their occupants submarine excessively during a crash (i.e., so that their bodies slide too far downward and forward, legs first). Many child restraint manufacturers and JPMA asked the agency to lengthen the knee excursion limits. They argued that many restraints, particularly reclining child restraints where the occupant's knees will be further forward than a non-reclining child restraint, cannot pass the knee excursion limit, but do not allow the occupants to submarine. They claimed that the reclining feature is a comfort and convenience device which promotes seat usage since it allows a child to sleep in the restraint. They recommended that the agency establish a separate requirement which would prevent the occupant's torso from straightening out and submarining under the belts. NHTSA has tested several child restraints in the reclining position and determined that the knee excursion can be lengthened to 36 inches without allowing submarining if the dummy's torso has rotated at least 15 degrees forward from its initial starting position when the knees have reached their maximum excursion. Thus, the new standard

incorporates a 36 inch knee excursion limit and requires the test dummy's torso to have rotated at least 15 degrees forward when the knees have reached their maximum excursion.

For rear-facing child restraints (i.e., infant carriers) the May 1978 notice proposed retaining the dummy's head within the confines of the seat and preventing the back support surface of the restraint from tipping forward far enough to allow the angle between it and the vertical to exceed 60 degrees. If the support surface were allowed to tip more, the infant in the restraint could slide head first out of the shoulder straps. GM and Heinrich Von Wimmersperg pointed out that there is a conflict between the description of the confines of rear-facing restraints contained in the text of the standard and the manner in which the confines are defined in one of the figures incorporated in the standard. The text has been modified to correctly identify the confines of the restraint systems. GM also commented that the text of the standard defined the head confinement requirements in reference to the head target points of the infant dummy, although the infant dummy, unlike the 3 year child test dummy, does not have target points. The revised specifications for the infant test dummy do include head target points and therefore the confinement requirement is retained as originally proposed.

Several child restraint manufacturers objected to limiting the forward tipping of rear-facing restraints to 60 degrees. They argued that rear-facing child restraints can tip as much as 70 degrees forward and still retain the child within the restraint. They also argued that a rear-facing restraint will hit the instrument panel in the front seat, or the back of the front seat if the restraint is used in the rear seat, before the restraint tips 60 degrees. NHTSA is retaining a limit on forward tipping since a child restraint can be used in a vehicle with the vehicle's front seat moved to its extreme forward or rearward position. If the child restraint is used in the front seat and the vehicle seat is in the extreme rearward position, the child restraint can tip forward without striking the instrument panel. Likewise, a child restraint used in the rear seat, where the vehicle's front seat is in its extreme forward position, can tip forward without striking the back of the front seat. However, tests done by NHTSA have shown that a restraint can tip forward as much as 70 degrees

while still retaining the child within the confines of the restraint. Therefore, the limitation on forward tipping is being changed to 70 rather than 60 degrees.

One child restraint manufacturer, the American Association for Automotive Medicine and Heinrich Von Wimmersperg commented that manufacturers of rear-facing restraints may attempt to comply with the limitation on forward rotation by designing the normal resting angle of the seat in a very vertical alignment or by adding attachments to prop the seat into a vertical position. Either of those approaches can create an uncomfortable seating position for the child. They recommended that the agency establish a minimum resting angle for rear-facing restraints. The agency is not adopting this suggestion at this time. By increasing the amount of forward rotation allowed, the agency should have removed the temptation for manufacturers to design restraint resting angles which would make it easier to comply with the requirement, but would create uncomfortable seating positions for the child.

The May 1978 notice proposed an additional dynamic test at 20 mph for child restraint systems equipped with tether straps with those straps left unattached. A number of commenters (such as Insurance Institute for Highway Safety, ACTS, University of Tennessee, Questor, Bobby Mac, and Michigan's Office of Highway Safety) commented that many people fail to connect the tether. They recommended that this type of restraint be tested at 30 mph with unattached tethers.

The agency is aware of the benefits and disadvantages of child restraints equipped with tethers, which presently account for over 70 percent of the child restraint sales. The agency's testing has shown that in 30 mph frontal tests child restraints with the tethers attached have less occupant excursion and lower head and chest accelerations than shield-type restraints that do not use tethers. Tethered restraints also allow far less occupant excursion in lateral crashes than shield-type restraints. The available accident data on child restraints, which includes consumer letters and accident investigation reports, is limited since the usage of child restraints is low. It does show, however, that tethered restraints, both properly tethered and untethered, have prevented injuries to children in crashes where other vehicle occupants were severely injured.

Because of the performance of properly tethered child restraints under testing and accident conditions, the agency does not want to eliminate those restraints from the market. At the same time, the agency wants to reduce or eliminate the possibility of people not using the tethers that accompany those restraints. Therefore, the agency is requiring all seats equipped with a tether to have a visible label warning people to correctly fasten the tether. In addition, the agency is considering issuing a proposal to require vehicle manufacturers to provide attachments for tether anchorages in all their vehicles. Having such attachments will enable parents to easily and properly attach tethers. The agency is also striving to promote the increased and proper use of child restraints through educational programs. As a part of this effort, NHTSA has conducted a series of regional seminars aimed at helping grass roots organizations educate parents about the importance of child restraints. A NHTSA-sponsored national conference on child restraint safety is scheduled for December 10-12 in Washington, D.C. to further these educational programs.

To ensure that restraints equipped with tethers provide at least a minimum level of protection if they are misused, the agency will require an additional dynamic test at 20 mph for those restraints. When tested with tethers unattached, the restraints must pass all the dynamic test performance requirements of the standard.

#### **Energy Absorption and Distribution**

Several manufacturers (Questor, Strollee, Cosco) and JPMA objected to the proposed height requirements for head restraints used to control the rearward movement of a child's head in a crash. The proposal would have slightly increased the requirements currently set in Standard No. 213. They argued that there was no basis for the change, which would require them to redesign their child restraints. The new requirements are based on anthropometric data on children gathered since the standard was originally adopted. NHTSA proposed the new head restraint height requirements in its earlier March 1974 notice of proposed rulemaking on child restraints and many manufacturers have already redesigned their seats to comply with the requirements. Since the new heights more accurately reflect the seating heights of children than the old requirements, the agency



is adopting them as proposed. The notice proposed that the top of the head restraint be 22 inches above the seating surface for restraints used by children weighing more than 40 pounds. Questor requested the upper weight be changed to 43 pounds. Since 40 pounds represents the weight of a 50th percentile 5 year old and 23 inches represents its seating height, the requirement is not changed.

Several manufacturers (Cosco, Strollee, Questor) and JPMA raised objections to the proposed requirement that head restraints of child restraint systems have a width of not less than 8 inches. They pointed out that the minimum head restraint width requirement is intended to prevent a child's head from going beyond the width of a head restraint in a lateral or rear impact. They argued that restraints with side supports or "wings" should not have to meet the 8 inch width requirement since the side supports will prevent an occupant's head from moving laterally outside the restraint system. NHTSA agrees that the side supports should help laterally retain the child's head within the restraint during a side or rear impact and therefore is exempting those restraints from the 8 inch minimum width requirement. However, to ensure that child restraints with side supports have sufficient width to accommodate the heads of the largest child using the restraint, the agency has set a 6 inch minimum width for those restraints. In addition, to ensure that side supports are large enough to retain an occupant's head within the restraint, the agency has set a minimum depth requirement of four inches for those supports. Anthropomorphic data show that the head of a 50th percentile 5 year old child measures 7 inches front to rear and is 6 inches in breadth. Therefore, a four inch support should contact a sufficient area of the child's head to restrain it.

Manufacturers also questioned if the 8 inch width requirements is to be measured in restraints with side support from the surface of the padded side support or from the surface of the underlying structure before the padding is added. The wording of the standard is changed to make clear that the distance is measured from the surface of the padding, since the padded surface must be wide enough to accommodate the child's head.

The notice proposed that the minimum head restraint height requirement would not apply to

restraints that use the vehicle's seat back to restrain the head, if the target point on the side of the head of the test dummy representing a 3 year old child is raised above the top of the seat back. Ford said that because of permitted differences in the dimensions of different test dummies and test seats, its child restraint will not consistently meet the requirements. Ford asked that the height requirement be changed or the manufacturers be permitted to restrict their restraints to seats with head restraints or to rear seats which have a flat surface immediately behind the seat. The standard allows a manufacturer to specify in its instruction manual accompanying the restraints which seating locations cannot be used with the child restraint. Therefore, no change is necessary, since Ford is allowed to restrict use of its restraint.

Several manufacturers (Cosco, Strollee, Questor) and JPMA objected to the proposed force distribution requirement set for the sides of child restraint systems. The specifications do not require manufacturers to incorporate side supports in their restraints, they only regulate the surfaces that the manufacturer decides to provide so that they distribute crash forces over the child's torso. The commenters requested that the agency define the term "torso" and explain the reason for setting different side support requirements for systems used by infants weighing less than 20 pounds than for systems used by children weighing 20 pounds or more. In restraints for infants less than 20 pounds, the minimum side surface area requirements are based on anthropometric data for a 6-month-old 50th percentile infant to ensure maximum lateral body contact in a side impact. Since the skeletal structure of an infant is just beginning to develop, it is important to distribute impact forces over as large a surface area of the child as possible, rather than concentrating the potentially injurious forces over a small area. For restraints used by children weighing more than 20 pounds and, therefore, having a more developed skeletal structure the minimum surface area requirement is based on anthropometric data for a 50th percentile 3-year-old child to provide restraint for the shoulder and hip areas of the child.

To enable manufacturers to determine their compliance with the torso support requirement, the standard follows the dictionary definition of



"torso" and defines the term as referring to the portion of the body of a seated anthropomorphic test dummy, excluding the thighs, that lies between the top of the seating surface and the top of the shoulders of the test dummy.

Several manufacturers (Cosco, Strollee, Questor) and JPMA questioned the basis for prohibiting surfaces with a radius of curvature of less than 3 inches. They and Hamill also asked if the measurement of the curvature is to be made before or after application of foam padding on the underlying surface. The radius of curvature limitation will prevent sharp surfaces that might concentrate potentially injurious forces on the child. It is based on the performance of systems with such a radius of curvature that have not produced injuries in real world crashes. The standard is changed to require the measurement of the radius of curvature to be made on the underlying structure of the restraint, before application of foam padding. Since foam compresses when impacted in a crash, it is important that the structure under the foam be sufficiently curved so it does not concentrate the crash forces on a limited area of the child's body.

For child restraints used by children weighing less than 20 pounds, the notice proposed that surfaces which can be contacted by the test dummy's head during dynamic testing must be padded with a material that meets certain thickness and static compression requirements. A number of manufacturers (Strollee, Cosco, GM and Questor) and JPMA questioned the specifications set for the padding, arguing that there is no need to change from the current materials and the specification of a minimum thickness is design restrictive. Other commenters (Bobby-Mac, Hamill and American Association for Automotive Medicine) requested that the agency establish a test to measure the energy-absorbing capabilities of the underlying structure of the restraint, as well as of the padding.

NHTSA eventually wants to establish dynamic test requirements using instrumented test dummies for restraints used by children weighing 20 pounds or less. Such testing would measure the total energy absorption capability of the padding and underlying structure. At present, there are no instrumented infant test dummies, so the agency is instead specifying long-established static tests of the padding material.

In response to manufacturer comments, the NHTSA has reevaluated the materials currently used in child restraints and determined that those and other widely available materials can apparently provide sufficient energy absorption if used with a specified thickness. The agency has changed the proposed compression-deflection requirements to allow the use of a wider range of materials which should enable manufacturers to provide protective padding for children without having to increase the price of the restraint.

The proposed ban on components, such as arm rests, directly in front of a child which do not restrain the child was objected to by JPMA, and some manufacturers (Strollee, Century Products, International Manufacturing). They argued that arm restraints should not be banned since they promote usage of a child restraint by giving the child an area to rest against or place a book or other plaything. Other manufacturers (Hamill, Bobby-Mac), Michigan's Office of Highway Safety, and the American Academy of Pediatrics supported the ban arguing that arm rests promote misuse by creating the impression that a child can be adequately restrained by merely placing the arm rest in front of the child. The agency is concerned that parents' mistaken beliefs about the protective capability of arm rests may mislead them into not using the harness systems in the restraints.

Therefore, such arm rests or other components only may be installed if they provide adequate protection to a child when the restraint is misused in a foreseeable way because of the presence of the arm rest (i.e., the child is not buckled into the harness that comes with the child restraint system). To measure the performance of child restraints with arm rests and other devices that flip down in front of the child, those restraints will be tested at 20 mph with the component placed in front of the child, but without the child strapped into the restraint system. The restraint must pass the occupant excursion and other dynamic performance requirements in that condition.

#### **Child Restraint Belt Systems**

The May 1978 notice proposed three alternatives for the buckle release force required for the harnesses that restrain a child within the restraint. Many manufacturers favored the alternative based on the current Standard No. 213 which establishes a maximum force of 20 pounds, but does not

establish a minimum force. In order to promote international harmonization, Volvo endorsed another alternative proposed by the Economic Commission of Europe which would set a minimum force of 2.25 pounds and a maximum of 13.45 pounds. However, Volvo proposed deviating from the ECE proposal and allowing a maximum release force of 20 pounds. Michigan's Office of Highway Safety and the American Seat Belt Council (ASBC) supported the other alternative which, based on a study by the National Swedish Road and Traffic Institute, would have set a 12 pound minimum force and a 20 pound maximum force. ASBC stated that this alternative should prevent a small child from opening the buckle, but not be too strong to prevent a small adult female from opening the buckle. Other commenters, such as ACTS and Borgess Hospital, recommended that the force be set at a level which children could not manage. Borgess noted that their experience with 400 rental child restraints shows that keeping children from unbuckling their restraints is a common problem. Physicians for Automotive Safety recommended that all buckle types be standardized and the release force be set at a level which can be quickly opened in an emergency.

Based on its review of the comments, NHTSA has decided to require buckles with a minimum release force of 12 pounds and a maximum release force of 20 pounds. The effectiveness of a restraint depends on the child being properly buckled at the time of impact. If a child is capable of releasing the buckle, it can inadvertently or purposely defeat the protection of the harness system. Setting a minimum force of 12 pounds should prevent small children from opening the buckle. Setting a maximum of 20 pounds as the release force will enable parents to easily open the buckle. NHTSA encourages manufacturers of child restraints to use push button buckles, similar to those used in automobile belts, so that people unfamiliar with child restraints can readily unbuckle them in emergencies. The agency will consider further rulemaking to standardize the buckle if manufacturers do not voluntarily adopt this approach.

Likewise, NHTSA has already advised child restraint manufacturers that physicians have informed the agency that some children are burned during the summer by over-heated metal buckles or other metal child restraint hardware. NHTSA will monitor manufacturer efforts to eliminate this

problem and determine if additional rulemaking is necessary.

The proposal that the belt systems in child restraints meet many of the belt and buckle requirements of Standard No. 209, *Seat Belt Assemblies*, such as those relating to abrasion, resistance to light, resistance to microorganisms, color fastness and corrosion and temperature resistance was not opposed by any of the commenters and is therefore adopted. The buckle release test in Standard No. 209 for child restraint buckles is deleted, since Standard 213 now sets new performance requirements for buckles. Ford noted that the proposal inadvertently dropped a portion of Standard No. 209's abrasion requirements, which have been reincorporated in the final rule.

To prevent the belts from concentrating crash forces over a narrow area of a child's body, the proposal sets a minimum belt width of 1½ inch for any belt that contacts the test dummy during the testings. Hamill requested that pieces of webbing used to position the principal belts that maintain crash loads be exempt from the minimum width requirements. The agency believes that as long as the test dummy, and thus a child, can contact the belts during a crash the belts should be wide enough to spread the crash forces and therefore Hamill's request is denied.

#### **Methods of Installation**

Many commenters, including ACTS, American Academy for Pediatrics, Insurance Institute for Highway Safety, and American Seat Belt Council, said that child restraint systems cannot be used with some automatic belt systems, since they do not have a lap belt to secure the child restraint to the seat. They asked the agency to require all automatic belt systems to include lap belts.

The agency considers the compatibility of child restraints with automatic belt systems to be an important issue. One of the purposes of the agency's December 12, 1979, public meeting on child safety and motor vehicles is to obtain the public's views and information on that and other child passenger safety issues to assist the agency in determining whether to commence rulemaking. One rulemaking option currently being considered by the agency is to require vehicle manufacturers to provide anchorages for lap belts in automatic restraint equipped vehicles so that parents wishing to install lap belts can easily do so.



A number of manufacturers are voluntarily taking steps to make automatic belt systems compatible with child restraint systems. For example, GM provides an additional manual belt with its optional automatic lap-shoulder belt system for the front passenger's seat in the 1980 model Chevrolet Chevette to enable parents to secure child restraint systems.

Many of the commenters also asked the agency to require vehicle manufacturers to install anchorages or provide predrilled holes to attach tether anchorages in all their vehicles. They argued such anchorages or holes will make it easy for parents to attach tether straps correctly. As mentioned earlier in this notice, the agency is considering issuing a proposal to require manufacturers to provide attachments for tether anchorages in all their vehicles.

The May 1978 notice proposed that all child restraints be capable of being secured to the vehicle seat by a lap belt. Volvo and Mercedes once again asked the agency to allow the use of "vehicle specific" child restraints (systems uniquely designed for installation in a particular make and model which do not utilize vehicle seat belts for anchorages). As explained in the May 1978 notice, such systems can easily be misused by being placed in vehicles for which they were not specifically designed. Standardizing all restraints by requiring them to be capable of being attached by a lap belt is an important way to prevent misuse.

However, since vehicle specific child restraints can provide adequate levels of protection when installed correctly, NHTSA is not prohibiting the manufacture of such devices. The new standard requires them to meet the performance requirements of the standard when secured by a vehicle lap belt. As long as child restraints can pass the performance requirements of the standard secured only by a lap belt, a manufacturer is free to specify other "vehicle specific" installation conditions.

### **Labeling**

The requirement for having a visible label permanently mounted to the restraint to encourage proper use of child restraints was supported by many of the commenters, including the Center for Auto Safety, ACTS, Insurance Institute for Highway Safety, and Michigan's Office of Highway Safety. Several manufacturers (Century, Cosco, Questor) objected to having a visible

label on child restraints, claiming that there is not enough space on some restraints to place all the required information. Other commenters supported the visible labeling requirement but suggested that the visible label only have a single warning telling people to follow the manufacturer's instructions (American Association for Automotive Medicine, Strollee, Hamill). Others suggested placing warnings about the correct use of the restraint on a visible label and placing such information as the height and weight limits for children using the restraint and the manufacturer's certification that it meets all Federal Motor Vehicle Safety Standards on a nonvisible label (GM, PAS).

After reviewing the comments, NHTSA concludes that it is important to have certain warnings in a visible position to serve as a constant reminder on how to correctly use the restraint. Because of the limited space on some restraints, the agency has shortened the labeling requirements to require only those instructions most directly concerned with the safe use of the seat be visible. Thus, depending on its design, the restraint must warn parents to secure the restraint with the vehicle lap belt, snugly adjust all belts provided with the restraint, correctly attach the top tether strap and only use a restraint adjustment position which are intended for use in a motor vehicle.

In response to the agency's request for other instructions that a manufacturer should give parents, several commenters (ACTS, Michigan's Office of Highway Safety, Borgess Hospital) said that a warning on the label is necessary to prevent misuse of infant carriers. They said many people mistakenly place infant carriers in a forward-facing, rather than a rear-facing position. A forward-facing position defeats the purpose of those restraints which are designed to spread the forces of the crash over the infant's back. Because of the importance of preventing this type of misuse, the agency will require the visible label to also remind parents not to use rear-facing infant restraints in any other position.

Information about the height and weight limits of the children for which the restraint is designed, the manufacturer and model of the child restraint, and the month, year and place of manufacture and the certification that the restraint complies with all applicable Federal Motor Vehicle Safety Standards would also have to be provided, but that information does not have to be on a label that is visible when the seat is installed.



Many commenters (GM, Insurance Institute for Highway Safety, Multnomah County Department of Human Services, Physicians for Automotive Safety, Center for Auto Safety, and American Academy of Pediatrics) supported the proposed requirement that manufacturers inform consumers about the primary consequences of not following the manufacturer's warning about the correct use of the restraint. Therefore, the visible label must state the primary consequence of misusing the restraint. The same information would also have to be included in the instruction manual accompanying the restraint.

Ford objected to the requirement that the label have a diagram showing the child restraint installed in a vehicle as specified in the manufacturer's instructions. It said that because of the complexity of the instructions required for proper installation of a restraint with different types of belt systems, it is not practical to place all of the information on a single label. Hamill suggested that because of those same considerations, the agency should only require the diagram to show the proper installation of the restraint at one seating position. Other commenters, such as the American Academy for Pediatrics, supported the use of diagrams on the restraint noting that diagrams can more easily convey information than written instructions.

To promote the correct use of child restraints, NHTSA believes that it is important to have a diagram on the restraint to remind users of the proper method of installation. However, so that the label does not become too unwieldy, the agency will only require manufacturers to provide a diagram showing the restraint correctly installed in the right front seating position with a continuous loop lap/shoulder belt and in the center rear seating position installed with a lap belt. For restraints equipped with top tethers, the diagram must show the tethers correctly attached in both seating positions. It is important to show the correct use of a child restraint with a continuous loop lap/shoulder belt (a type of belt system used on many current cars) since such belts must have a locking clip installed on the belt to safely secure the child restraint.

GM objected to the requirement that the label be in block type, which it said makes the label difficult to read. GM requested that manufacturers be

allowed to use 10 point type with either capitals or upper and lower case lettering. GM said that using such type will result in an easier to read label which, in turn, should promote more complete reading of the label by the consumer. Since the type sought by GM should promote the reading of the label, the agency is changing the requirement to allow the use of such type as an option.

Several organizations (ACTS, Center for Auto Safety and Insurance Institute for Highway Safety) asked the agency to establish performance test to accompany the requirement that the label be permanently affixed to the restraint. They pointed out that some current paper labels peel off after the restraint has been used awhile. NHTSA has not conducted the necessary testing to establish such a requirement. NHTSA urges manufacturers, whenever possible, to mold the label into the surface of the restraint rather than use a paper label.

Consumers Union and the Center for Auto Safety suggested that all restraints be graded based on their performance in frontal and lateral crash tests and the grades be posted on all the packaging, labels, and instruction manuals accompanying the child restraint. The grades would indicate the seating position within the vehicle with which the restraint can be safely used. Neither Consumers Union nor the Center suggested any performance requirements for establishing the different grades. Since the proposed grading system is outside of the scope of the proposed rule and the agency has not done the necessary testing to determine the specific tests and performance requirements necessary to establish such grading system, NHTSA will evaluate the suggestion for use in future rulemaking.

#### **Installation Instructions**

The May 1978 notice proposed that each restraint be accompanied by instructions for correctly installing the restraint in any passenger seat in motor vehicles. Many commenters (Center for Auto Safety, Borgess and Rainbow Hospitals, University of Tennessee And ACTS) suggested that the requirement for the instructions to accompany the restraint should be more explicit to require the restraint to have a storage location, such as a slot in the restraint or a plastic pouch affixed to the restraint, for permanently storing the instructions. They point out that storing the

instructions with the restraint means they will be available for ready reference and will be passed on to subsequent owners of the restraint. NHTSA believes such a requirement would best carry out its intent to require the instructions to be easily available to all users and therefore the suggestion is adopted.

Several manufacturers (Strollee, Cosco) and JPMA objected to the agency's proposed requirement that the instructions state that the center rear seating position is the safest seating position in a vehicle. While not questioning the validity of the accident data showing the center rear seat to be the safest seating position in most vehicles, they argued that the agency should consider the psychological impact of not having the child near the adult. Accident data have consistently shown that the occupants in the rear seat are safer than occupants in the front seat. The same data show that the center rear seating position is the safest seating position in the rear seat. To enable parents to make an informed judgment about how best to protect their children, NHTSA believes that it is important to clearly inform them about the safest seating positions in the vehicle, and is therefore retaining the requirement.

In response to the agency's request for additional suggestions to be included in the instruction manual accompanying the restraint, ACTS suggested that car bed manufacturers inform consumers that the child should be placed with its head near the center of the vehicle. Because orienting a child's head in that way will ensure that it is the maximum distance away from the sides of the vehicle in a side impact, the agency has adopted ACTS suggestion. Tennessee's Office of Urban and Federal Affairs suggested that users should be told to secure child restraints with a vehicle belt when the child restraint is in the vehicle but not in use. Since an unsecured child restraint can become a flying missile in a crash and injure other vehicle occupants, the agency has adopted Tennessee's suggestion.

### **Test Conditions**

The standard specifies requirements for a test assembly representing a vehicle bench seat to be used in the dynamic testing. Bobby-Mac commented that the test seat has a more level seating surface and less support at the forward edge of the seat than the seats in many current cars. These

differences mean that a child restraint may experience more excursion on the test seat than on more angled and firmer car seats, Bobby-Mac said. NHTSA agrees that in comparison to some vehicles seats, the test seat may present more demanding test conditions. However, the test seat is representative of many seats used in vehicles currently on the road. Meeting the performance requirement of the standard on the test seat will ensure that child restraints perform adequately on the variety of different seats found in cars on the road.

Several manufacturers (Cosco and Strollee) and JPMA raised questions about the requirement proposed for the crash pulse (i.e., the amount of test sled deceleration required to simulate the crash forces experienced by a car) for the 20 and 30 mph tests. The agency had proposed a range of sled test pulses to allow manufacturers the option of using pneumatic or impact sled testing machines. Since a variety of different sled test pulses would be permitted under the proposal, manufacturers asked the agency to explain what would happen if they and the agency tested a child restraint system using different sled test pulses and produced inconsistent results (i.e., a failure using one pulse and a pass at the other, when both pulses were within the permissible range). JPMA suggested that the agency should consider a restraint as in compliance if the restraint meets all the applicable performance requirements in a test in which the sled test pulse lies entirely within the proposed range.

To provide manufacturers with the certainty they desire, the agency has redefined the sled test pulse requirement to establish a single 20 mph (Figure 3) and a single 30 mph (Figure 2) sled test pulse. Thus, in conducting its compliance testing, NHTSA may not exceed the sled test pulse set for the 20 and 30 mph tests. The sled test pulses chosen by NHTSA are the least severe pulses that meet the acceleration thresholds proposed in the notice of proposed rulemaking. Manufacturers are free to use other sled pulses, as long as the acceleration/time curve of the sled test pulse used is equal to or greater than the acceleration/time curve of the sled test pulse set in the standard.

In response to comments by Ford and others that the durability of the foam used in the standard seat assembly may influence the test results, the agency has changed the standard to specify that the foam in the test seat be changed after each test.



GM pointed out that the instructions for positioning the test dummy within the restraint did not specify when in the positioning sequences any of the restraint's belts should be placed on the test dummy. An appropriate change has been made to specify when the belts should be attached. Ford said that the dummy positioning requirements result in an "unnatural" positioning of the dummy within its Tot-Guard restraint so that the dummy's arms rest on the side of the restraint rather than with its arms on the padded portion of the shield. NHTSA notes that a child in a real-world accident will not necessarily have its arms resting on the shield. Allowing the test dummy's arm to be positioned on the shield may inhibit the dummy's forward movement and make it easier to comply with the limits on test dummy excursion and acceleration set in the standard. Thus, Ford's requested change in the positioning requirements is rejected.

#### **Flammability**

The notice proposed requiring child restraints to meet the burn resistance requirements of Standard No. 302, *Flammability of Interior Materials*. The requirement was supported by GM, the American Academy of Pediatrics and the American Seat Belt Council. No commenters opposed the requirement. In supporting the requirement, GM said that the flammability characteristics of child restraints, "which are in close proximity to an occupant," should be "compatible with the flammability characteristics of other parts of the vehicle occupant compartment interior," which already must meet the performance requirements of Standard No. 302. The agency agrees with GM about the desirability of providing all vehicle occupants with the protection of Standard No. 302 and is thus requiring all child restraints to meet the performance requirements of that standard.

#### **Inertial Reels**

Several commenters raised questions about the effectiveness of vehicle seat belts equipped with inertial reels in securing child restraints. The American Academy of Pediatrics requested the agency to restrict the use of inertial reels to the driver's seating position. Physicians for Automotive Safety and ACTS pointed out that continuous loop lap/shoulder belts with inertial reels must be used with locking clips to secure a child restraint. They

said that the difficulty of installing such clips deters their use.

Agency research has found that use of inertial reels increases the comfort and convenience of seat belts and thus promotes their use by older children and adults. Thus, the agency will continue to require the use of inertial reels in vehicle belt systems. However, to ensure that inertial reels are compatible with child restraints, the agency will soon begin rulemaking on the comfort and convenience of vehicle belt systems to require that the belts used in the front right outboard seating position have a manual locking device. This requirement will mean that continuous loop and other types of inertial reel belt systems can be easily and effectively used with child restraints. Such manual locking devices will also be permitted with belts used in the rear seats. As previously outlined in this notice, the agency has established several labeling and installation instruction requirements which deal specifically with the correct use of locking clips on continuous loop belts with inertial reels. Those requirements should reduce or eliminate problems associated with using child restraint in current vehicles equipped with inertial reels.

#### **Costs and Benefits**

The agency has considered the economic and other impacts of this final rule and determined that this rule is not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures implementing that order. The agency's assessment of the benefits and economic consequences of this final rule are contained in a regulatory evaluation which has been placed in the docket. Copies of that regulatory evaluation can be obtained by writing NHTSA's docket section, at the address given in the beginning of this notice.

In the 0 to 5 age group, more than 800 children are killed and more than 100,000 children are injured annually as occupants of motor vehicles. Because of the large difference in effectiveness between restraints that can pass the dynamic test of the new standard and those which have passed only a static test, NHTSA projects that there should be 43 fewer deaths and 6,528 fewer injuries per year. Because many restraints have already been upgraded in response to the agency's prior rulemaking proposal, some of the death and injury



prevention benefits of the standard have already been realized.

The projected benefits of this standard are limited by the existing low rate of child restraint use. However, the labeling and instruction requirements of this standard should increase the proper usage of child restraints.

Because of NHTSA's 1974 proposal to upgrade child restraints, many manufacturers have currently designed their restraints to meet dynamic test requirements. Therefore, those restraints are only projected to increase in price by approximately \$1.00 in order to meet the other requirements of this standard. Restraints that do not currently pass dynamic tests would have a price increase of \$16.00 to meet the new requirements. The average sales weighted price increase is \$4.25.

Numerous commenters (including National Safety Council, American Academy of Pediatricians, Tennessee Office of Child Development and North Dakota's Department of Public Health)

urged the agency to make the standard effective before the proposed May 1, 1980, effective date. GM and the American Safety Belt Council requested that the effective date be delayed beyond the proposed May 1, 1980. Many manufacturers have already upgraded their restraints to the performance requirements set in this rule. The agency believes that providing six months lead-time, until June 1, 1980, will provide sufficient time for the remaining manufacturers to upgrade their restraints.

The principal authors of this notice are Vladislav Radovich, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on December 5, 1979.

Joan Claybrook  
Administrator,

**44 F.R. 72131**  
**December 13, 1979**



# PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 213

## Child Restraint Systems; Seat Belt Assemblies

(Docket No. 74-9; Notice 7)

**ACTION:** Response to petitions for reconsideration.

**SUMMARY:** This notice responds to five petitions for reconsideration and petitions for rulemaking concerning Standard No. 213, *Child Restraint Systems*. In response to the petitions, the agency is changing the labeling requirements to permit the use of alternative language, modifying the minimum radius of curvature requirement for restraint system surfaces and extending the effective date of the standard from June 1, 1980, to January 1, 1981. In addition, several typographic errors are corrected in Standard No. 209, *Seat Belt Assemblies*.

**EFFECTIVE DATE:** The amendments are effective on May 1, 1980. The effective date of the standard is changed from June 1, 1980, to January 1, 1981.

**FOR FURTHER INFORMATION CONTACT:**

Mr. Vladislav Radovich,  
Office of Vehicle Standards,  
National Highway Traffic Safety Administration  
Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:** On December 13, 1979, NHTSA published in the *FEDERAL REGISTER* a final rule establishing Standard No. 213, *Child Restraint Systems*, and making certain amendments to Standard No. 209, *Seat Belt Assemblies and Anchorages*. Subsequently, petitions for reconsideration were timely filed with the agency by Cosco, General Motors, Juvenile Products Manufacturers Association, and Strolee. Subsequent to the time for filing petitions for reconsideration, Strolee also filed a petition for

rulemaking to amend the standard. After evaluating the petitions, the agency has decided to modify, as fully explained below, some of the requirements of Standard No. 213. All other requests for modification are denied. The agency is also correcting several minor typographical errors in the text of Standard No. 209.

### LABELING

Standard No. 213 requires manufacturers to place a permanently mounted label on the restraint to encourage its proper use. General Motors (GM) petitioned for reconsideration of three of the labeling requirements.

Section S5.5.2 (f) of the standard requires each child restraint to be labeled with the size and weight ranges of children capable of using the restraint. In its petition, GM said that the requirement could "unnecessarily preclude some children from using the restraint or suggest use by children too large for the restraint." GM also commented that some infant restraints are intended to be used from birth and thus the lower size and weight limitation serves no purpose.

In addition, GM said that stating the upper size limit for infant restraints in terms of seated height rather than in standing height is a more appropriate way to set size limitations for infants. For example, GM said that an infant with a short torso and long legs might be precluded from using the restraint if the limitation is stated in terms of standing height, while an infant with short legs and a torso too long for the restraint would be inappropriately included among ones who could supposedly use the restraint. GM requested that infant restraints be allowed to be labeled with an optional statement limiting use by upper weight and seated height.



NHTSA agrees that specifying a lower weight and size limit is unnecessary for an infant carrier designed to be used from birth and has amended the standard accordingly. The agency has decided not to adopt GM's proposal to state the upper size limit in seating rather than standing height. The purpose of the label is to provide important instructions and warnings in as simple and understandable terms as possible. Standing height, rather than seating height, is a measurement parents are familiar with and which is commonly measured during pediatric examinations. As GM pointed out, it is possible to establish a limit based on standing height which would exclude any infant whose seating height is too high to properly use the restraint. Therefore, the agency will continue to require the upper size limit to be stated in terms of standing height.

GM also requested that manufacturers be allowed to establish a lower usage limit for restraints used for older children based on the child's ability to sit upright rather than on his or her size and weight. GM said the lower limit "is not as dependent upon the child's size as it is on the child's ability to hold its head up (sit upright) by itself. This important capability is achieved at a wide range of child sizes." NHTSA agrees that the type of label GM proposes can clearly inform parents on which children can safely use a restraint and therefore will permit use of such a label.

Section S5.5.2(g) of the standard requires the use of the word "Warning" preceding the statement that failure to follow the manufacturer's instructions can lead to injury to a child. GM requested that the word "Caution" be permitted as an alternative to "Warning." GM said that since 1975 it has used caution in its labels and owners' and service manuals as a lead or signal word where the message conveys instructions to prevent possible personal injury. GM said that the words caution and warning are generally accepted as synonymous.

The agency believes that the word "Warning," when used in its ordinary dictionary sense, is a stronger term that conveys a greater sense of danger than the word "Caution" and thus will emphasize the importance of following the specified instructions. Therefore, the agency will continue to require the use of the word "Warning."

Section S5.5.2(k) of the standard requires restraints to be labeled that they are to be used in a

rear-facing position when used with an infant. GM said that while the requirement is appropriate for so-called convertible child restraints (restraints that can be used by infants in a rear-facing position and by children in a forward-facing position), it is potentially misleading when used with a restraint designed exclusively for infants. GM said the current label might imply that the restraint can be used in forward-facing positions with children. GM recommended that restraints designed only for infants be permitted to have the statement, "Place this infant restraint in a rear-facing position when using it in the vehicle." The agency's purpose for establishing the labeling requirement was to preclude the apparent widespread misuse of restraints designed for infants in a forward-facing rather than rear-facing position. Since GM's recommended label will accomplish that goal, the agency is amending the standard to permit its use.

#### RADIUS OF CURVATURE

Section S5.2.2.1(c) of the standard requires surfaces designed to restrain the forward movement of a child's torso to be flat or convex with a radius of curvature of the underlying structure of not less than 3 inches. Ford Motor Co. objected to the three inch limitation on radius of curvature arguing that measuring the radius of curvature of the underlying structure would eliminate designs that have not produced serious injuries in actual crashes. Ford said the shield of its Tot-Guard has a radius of curvature from 2.2 to 2.3 inches and it had no evidence of serious injury being caused by the shield when the restraint has been properly used.

The purpose of the radius of curvature requirement was to prohibit the use of surfaces that might concentrate impact forces on vulnerable portions of a child's body. It was not the agency's intent to prohibit existing designs, such as the Tot-Guard, which have not produced injuries in actual crashes. Since a 2 inch radius of curvature should therefore not produce injury, the agency has decided to change the radius of curvature requirement from 3 to 2 inches.

Although the standard sets a minimum radius of curvature for surfaces designed to restrain the forward movement of a child, it does not set a minimum surface area for that surface. Prototypes of new restraints shown to the agency by some manufacturers indicate that they are voluntarily incorporating sufficient surface areas in their designs. The agency encourages all manufacturers to use surface areas at least equivalent to those of the designs used by today's better restraints.

## OCCUPANT EXCURSION

Section S5.1.3.1 of the standard sets a limit on the amount of knee excursion experienced by the test dummy during the simulated crash tests. It specifies that "at the time of maximum knee forward excursion the forward rotation of the dummy's torso from the dummy's initial seating configuration shall be at least 15° measured in the sagittal plane along the line connecting the shoulder and hip pivot points."

Ford Motor Co. objected to the requirements that the dummy's torso rotate at least 15 degrees. Ford said that it is impossible to measure the 15 degree angle on restraints such as the Tot-Guard since the test dummy "folds around the shield in such a manner that there is no 'line' from the shoulder to the hip point." In addition, restraints, such as the Tot-Guard, that enclose the lower torso of the child can conceal the test dummy hip pivot point.

The agency established the knee excursion and torso rotation requirements to prevent manufacturers from controlling the amount of test dummy head excursion by allowing the test dummy to submarine excessively during a crash (i.e., allowing the test dummy to slide too far downward underneath the lap belt and forward, legs first). A review of the agency's testing of child restraints shows that current designs that comply with the knee excursion limit do not allow submarining. Since the knee excursion limit apparently will provide sufficient protection to prevent submarining, the agency has decided to drop the torso rotation requirement. If future testing discloses any problems with submarining, the agency will act to establish a new torso rotation requirement as an additional safeguard.

## HEAD IMPACT PROTECTION

Section 5.2.3 requires that each child restraint designed for use by children under 20 pounds have energy-absorbing material covering "each system surface which is contactable by the dummy head." Strolee petitioned the agency to amend this requirement because it would prohibit the use of unpadded grommets in the child restraint. Strolee explained that some "manufacturers use grommets to support the fabric portions of a car seat where the shoulder belt and lap belt penetrate the upholstery. These grommets retain the fabric in place and give needed support where the strap

comes through to the front of the unit." Because of the use of the grommets in positioning the energy-absorbing padding and belts, the agency does not want to prohibit their use. However, to ensure that use of the grommets will not compromise the head impact protection for the child, the agency will only allow grommets or other structures that comply with the protrusion limitations specified in section S5.2.4. That section prohibits protrusions that are more than  $\frac{3}{8}$  of an inch high and have a radius of less than  $\frac{1}{4}$  inch. Because this amendment makes a minor change in the standard to relieve a restriction, prior notice and a comment period are deemed unnecessary.

## BELT REQUIREMENTS

Strolee petitioned the agency to amend the requirement that all of the belts used in the child restraint system must be 1½ inches in width. Strolee said that straps used in some restraints to position the upper torso restraints have "snaps" so that the parent may release this positioning belt conveniently." Strolee argued that such straps should be exempt from the belt width requirement since "the snap would release far before any loads could be experienced."

The agency still believes that any belt that comes into contact with the child should be of a minimum width so as not to concentrate forces on a limited area of the child. This requirement would reduce the possibility of injury in instances where the snap on a positioning strap failed to open. Strolee's petition is therefore denied.

Strolee has also raised a question about the interpretation of section S5.4.3.3 on belt systems. Strolee asked whether the section requires a manufacturer to provide both upper torso belts, a lap belt and a crotch strap or whether a manufacturer can use a "hybrid" system which uses upper torso belts, a shield, in place of a lap belt, and a crotch strap. The agency's intent was to allow the use of hybrid systems. The agency established the minimum radius of curvature requirements of section S5.2.2.1(c) to ensure that any shield used in place of a lap or other belt would not concentrate forces on a limited area of the child's body. NHTSA has amended section S5.4.3.3. to clarify the agency's intent. Because this is an interpretative amendment, which imposes no new restrictions, prior notice and a comment period are deemed unnecessary.



## HEIGHT REQUIREMENTS

Strolee asked the agency to reconsider the requirements for seat back surface heights set in section S.5.2.1.1. Strolee argued that the higher seat back required by the standard would restrict the driver's rear vision when the child restraint is placed in the rear seat.

The final rule established a new seat back height requirement for restraints recommended for use by children that weigh more than 40 pounds. To provide sufficient protection for those children's heads, the agency required the seat back height to be 22 inches. The agency explained that the 22 inch requirement was based on anthropometric data showing that the seating height of children weighing 40 or more pounds can exceed 23 inches. The agency still believes that 22 inch requirement is necessary for the protection of the largest child for which the restraint is recommended. NHTSA notes that child restraints can be designed to accommodate the higher seat backs without allowing the overall height of the child restraint to unduly hinder the driver's vision.

## PADDING

In its petition, JPMA claimed that the standard "calls for the application of outdated specifications" for determining the performance of child restraint padding in a 25 percent compression-deflection test. A review of the most recent edition of the American Society for Testing and Materials (ASTM) handbook shows that the compression-deflection test in two of the three ASTM standards (ASTM D1565) referenced by the agency has been replaced. However, the replacement standard does not contain a 25 percent compression-deflection test. Therefore, the agency will continue to use the three ASTM standards referenced in the December 1979 final rule.

## EFFECTIVE DATE

Cosco, Strolee and the Juvenile Products Manufacturers Association (JPMA) petitioned the agency for an extension of the June 1, 1980, effective date. They requested that the effective date be changed to at least January 1, 1981, and Strolee requested a delay until March 1, 1981. They argued that the June 1, 1980, effective date does not allow manufacturers sufficient time to develop, test and tool new child restraints.

Testing done for the agency has shown that many of the better child restraint systems currently on the

market can meet the injury criteria and occupant excursion limitation set by the standard. Some of those seats would need changes in their labeling, removal of arm rests and new belt buckles and padding to meet the standard. Such relatively minor changes can be made in the time available before the June 1, 1980, effective date.

Several manufacturers have informed the agency that they are designing new restraints to meet the standard. Based on prototypes of those restraints shown to the agency, NHTSA believes that these new restraints may be more convenient to use, less susceptible to misuse and provide a higher overall level of protection than current restraints. Based on leadtime information provided by individual manufacturers and the JPMA, the agency concludes that extending the standard from June 1, 1980, to January 1, 1981, will provide sufficient leadtime. Providing a year's leadtime is in agreement with the leadtime estimates provided by the manufacturers as to the time necessary for design and testing, tooling and buckle redesign.

## COMPATIBILITY WITH VEHICLE BELTS

On December 12, 1979, NHTSA held a public meeting on child transportation safety. At that meeting, several participants commented about the difficulty, and in some cases the impossibility, of securing some child restraint systems with a vehicle lap belt because the belt will not go around the restraint. Testing done by the agency during the development of the recently proposed comfort and convenience rulemaking also confirms that problem. The agency reminds child restraint manufacturers that Standard No. 213, *Child Restraint Systems*, requires all child restraints to be capable of being restrained by a vehicle lap belt.

Joan Claybrook  
Administrator

**45 F.R. 29045  
May 1, 1980**



# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213**

**Child Restraint Systems  
(Docket No. 74-09; Notice 8)**

**ACTION:** Correction.

**SUMMARY:** On May 1, 1980, the agency published a notice in the *Federal Register* responding to petitions for reconsideration concerning Standard No. 213, Child Restraint Systems. In response to a petition from Ford Motor Co., the agency stated in the preamble of the notice that it was eliminating the torso rotation requirement of the standard. However, the notice inadvertently did not amend the standard to delete that requirement. This notice makes the necessary amendment.

**DATES:** The amendment is effective upon publication in the *Federal Register*, October 6, 1980.

**FOR FURTHER INFORMATION CONTACT:**

Stephen Oesch, Office of Chief Counsel,  
National Highway Traffic Safety  
Administration, 400 Seventh Street, S.W.,  
Washington, D.C. (202-426-2992)

**SUPPLEMENTARY INFORMATION:** On May 1, 1980, the agency published a notice responding to several petitions for reconsideration concerning Standard No. 213, Child Restraint Systems (45 FR 29045).

Among the petitions was one from Ford Motor Co. objecting to the requirement that the test dummy's torso rotate at least 15 degrees during the simulated crash test of the child restraint. Ford argued that it is impossible to measure the 15 degree angle on restraints such as its Tot-Guard which enclose the lower torso of the child and thus conceal one of the pivot points used in measuring the dummy's rotation.

In response to the Ford petition, the agency decided to drop the torso rotation requirement. In

the May 1 notice, the agency explained that the purpose of the requirement was to prevent manufacturers from controlling the amount of head excursion by allowing the test dummy to submerge excessively during a crash (i.e., allowing the test dummy to slide too far downward underneath the lap belt and forward, legs first). After further reviewing its child restraint test results, the agency concluded that restraints meeting the knee excursion limit of the standard will provide sufficient protection to prevent such submarining.

Section 5.1.3.1 is revised to read as follows:

**S5.1.3.1 Child restraint systems other than rear-facing ones and car beds.** In the case of each child restraint system other than a rear-facing child restraint system or a car bed, the test dummy's torso shall be retained within the system and no portion of the test dummy's head shall pass through the vertical transverse plane that is 32 inches forward of point z on the standard seat assembly, measured along the center SORL (as illustrated in Figure 1B), and neither knee pivot point shall pass through the vertical transverse plane that is 36 inches forward of point z on the standard seat assembly, measured along the center SORL.

Issued on September 26, 1980.

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Michael M. Finkelstein  
Associate Administrator  
for Rulemaking

**45 FR 67095  
October 9, 1980**



# **PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213**

## **Child Restraint Systems (Docket No. 74-09; Notice 9)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends Standard No. 213, Child Restraint Systems, to allow the use of thinner padding materials in some child restraints. The agency proposed the amendment in response to a petition for rulemaking filed by General Motors Corporation.

**DATES:** The amendment is effective on December 15, 1980.

**ADDRESSES:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours: 8:00 a.m. to 4:00 p.m.)

**FOR FURTHER INFORMATION CONTACT:**

Mr. Vladislav Radovich, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:** On December 13, 1979, NHTSA issued Standard No. 213, Child Restraint Systems (44 FR 72131). The standard established new performance requirements for child restraints, including requirements for the padding used in child restraint systems recommended for use by children under 20 pounds (i.e., infant carriers).

The padding requirements provide that surfaces of the infant carrier that can be contacted by the test dummy's head during dynamic testing must be padded with a material that meets certain thickness and static compression-deflection requirements. The standard requires that the pad-

ding must have a 25 percent compression-deflection resistance of not less than 0.5 and not more than 10 pounds per square inch (psi). Material with a resistance of between 3 and 10 psi must have a thickness of  $\frac{1}{2}$  inch. If the material has a resistance of less than 3 psi, it must have a thickness of at least  $\frac{3}{4}$  inch.

In response to a petition for rulemaking filed by General Motors Corporation (GM), the agency proposed on October 17, 1980 (45 FR 68694) to modify the padding requirements to allow the use of thinner padding. GM's petition said that the compression-deflection resistance of padding is sensitive to the rate at which deflection occurs during the test procedure. As the deflection rate increases during testing, so does the measured resistance of the material. GM said that the padding used in the head impact area of its child seat has a maximum compression-deflection resistance of 3 psi. However, several different deflection rates are permitted by the American Society for Testing and Materials test procedures incorporated into Standard No. 213. GM reported that the measured 25 percent compression-deflection value of the padding it uses can be as low as 1.8 psi.

To accommodate variations attributable to the use of the different deflection rates permitted in the testing, the agency proposed to allow the use of padding with a compression-deflection resistance of 1.8 psi or more to have a minimum thickness of  $\frac{1}{2}$  inch.

The notice denied GM's petition to permit the use of padding with a compression-deflection resistance of 0.2 psi and a thickness of  $\frac{3}{8}$  or  $\frac{3}{4}$  inch.

GM, the only party that commented on the proposal, supported the proposed revision.

GM requested the agency to reconsider its decision to prohibit the use of padding with a compression-deflection resistance of 0.2 psi. GM argued that the field performance of its child



restraints shows that current padding material is effective in reducing deaths and injuries.

As explained in the October notice, the agency agrees that child restraints, such as GM's infant carrier, which have an energy-absorbing shell can provide effective protection with padding having a compression-deflection resistance of 0.2 psi. Many infant carriers, however, use rigid plastic shells rather than energy absorbing shells. Manufacturers of the rigid plastic shells currently use padding with a compression-deflection resistance of 0.5 psi. The agency does not want to degrade that level of performance and therefore GM's request is again denied.

#### COSTS

The agency has assessed the economic and other impacts of the proposed change to the padding requirements and determined that they are not significant within the meaning of Executive Order 12221 and the Department of Transportation's policies and procedures for implementing that order. Based on that assessment, the agency concludes further that the economic and other consequences of this proposal are so minimal that additional regulatory evaluation is not warranted. When Standard No. 213 was published in the *Federal Register* on December 12, 1979, the agency placed in the docket for that rulemaking a regulatory evaluation assessing the effect of the padding requirements set by the standard. The effect of that rule adopted today is to permit the use of some padding materials in a thickness of  $\frac{1}{2}$  inch rather than  $\frac{3}{4}$  inches. Such a change will slightly reduce manufacturer padding costs.

The agency finds, for good cause shown, that an immediate effective date for this amendment is in the public interest since it relieves a restriction in the standard that goes into effect on January 1, 1981.

The principal authors of this notice are Vladislav Radovich, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

For the reasons set out in the preamble, Part 571 of Chapter V of Title 49, Code of Federal Regulations, is amended as set forth below.

#### §571.213 [Amended]

1. 49 CFR Part 571 is amended by revising paragraph §S5.2.3.2(b) of §571.213 to read as follows:

\* \* \* \* \*

(b) A thickness of not less than  $\frac{1}{2}$  inch for materials having a 25 percent compression-deflection resistance of not less than 1.8 and not more than 10 pounds per square inch when tested in accordance with S6.3. Materials having 25 percent compression-deflection resistance of less than 1.8 pounds per square inch shall have a thickness of not less than  $\frac{3}{4}$  inch.

Issued on December 8, 1980.

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Joan Claybrook  
Administrator

45 FR 82264  
December 15, 1980

# FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

## Child Restraint Systems, Seat Belt Assemblies, and Anchorages

(Docket No. 74-9; Notice 6)

**S1. Scope.** This standard specifies requirements for child restraint systems used in motor vehicles.

**S2. Purpose.** The purpose of this standard is to reduce the number of children killed or injured in motor vehicle crashes.

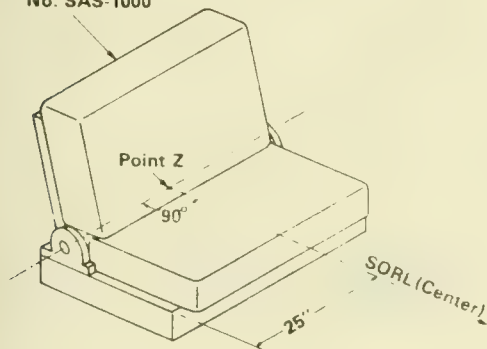
**S3. Application.** This standard applies to child restraint systems for use in motor vehicles.

**S4. Definitions.** "Car bed" means a child restraint system designed to restrain or position a child in the supine or prone position on a continuous flat surface.

"Child restraint system" means any device, except Type I or Type II seat belts, designed for use in a motor vehicle to restrain, seat, or position children who weigh not more than 30 pounds.

"Contactable surface" means any child restraint system surface (other than that of a belt, belt buckle, or belt adjustment hardware) that may contact any part of the head or torso of the appropriate test dummy, specified in S7, when a child restraint system is tested in accordance with S6.1.

Ref. NHTSA Drawing  
No. SAS-1000



SORL - SEAT ORIENTATION REFERENCE LINE (HORIZONTAL)

SORL Location on the Standard Seat

FIGURE 1A

"Seat orientation reference line" or "SORL" means the horizontal line through Point Z as illustrated in Figure 1A.

"Torso" means the portion of the body of a seated anthropomorphic test dummy, excluding the thighs, that lies between the top of the child restraint system seating surface and the top of the shoulders of the test dummy.

**S5. Requirements.** Each child restraint system shall meet the requirements in this section when, as specified, tested in accordance with S6.1.

### S5.1 Dynamic performance.

**S5.1.1 Child restraint system integrity.** When tested in accordance with S6.1, each child restraint system shall:

(a) Exhibit no complete separation of any load bearing structural element and no partial separation exposing either surfaces with a radius of less than  $\frac{1}{4}$  inch or surfaces with protrusions greater than  $\frac{3}{8}$  inch above the immediate adjacent surrounding contactable surface of any structural element of the system;

(b) If adjustable to different positions, remain in the same adjustment position during the testing as it was immediately before the testing; and

(c) If a front facing child restraint system, not allow the angle between the system's back support surfaces for the child and the system's seating surface to be less than 45 degrees at the completion of the test.

**S5.1.2 Injury criteria.** When tested in accordance with S6.1, each child restraint system that, in accordance with S5.5.2(f), is recommended for use by children weighing more than 20 pounds, shall—

(a) Limit the resultant acceleration at the location of the accelerometer mounted in the test dummy head as specified in Part 572 such that the expression:

$$\left[ -\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5} (t_2 - t_1)$$

shall not exceed 1,000, where  $a$  is the resultant acceleration expressed as a multiple of  $g$  (the acceleration of gravity), and  $t_1$  and  $t_2$ , are any two moments during the impacts.

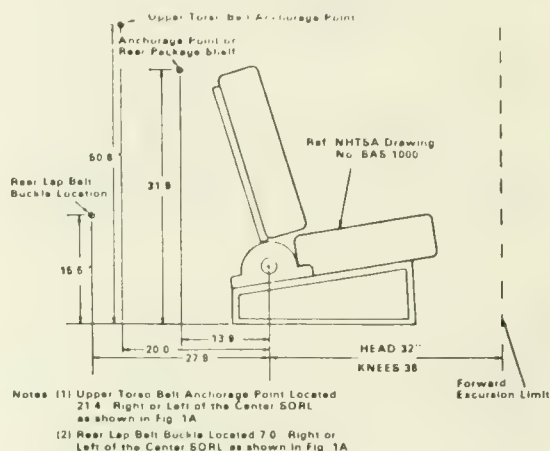
(b) Limit the resultant acceleration at the location of the accelerometer mounted in the test dummy upper thorax as specified in Part 572 to not more than 60  $g$ 's, except for intervals whose cumulative duration is not more than 3 milliseconds.

**S5.1.3 Occupant excursion.** When tested in accordance with S6.1 and adjusted in any position which the manufacturer has not, in accordance with S5.5.2(i), specifically warned against using in motor vehicles, each child restraint system shall meet the applicable excursion limit requirements specified in S5.1.3.1—S5.1.3.3.

**[S5.1.3.1 Child restraint systems other than rear-facing ones and car beds.** In the case of each child restraint system other than a rear-facing child restraint system or a car bed, the test dummy's torso shall be retained within the system and no portion of the test dummy's head shall pass through the vertical transverse plane that is 32 inches forward of point Z on the standard seat assembly, measured along the center SORL (as illustrated in Figure 1B), and neither knee pivot point shall pass through the vertical transverse plane that is 36 inches forward of point Z on the standard seat assembly, measured along the center SORL. (45 F.R. 67095—October 9, 1980. Effective: 10/7/80)]

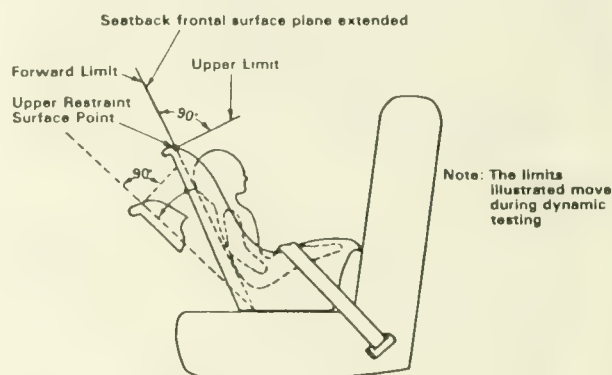
**S5.1.3.2 Rear-facing child restraint systems.** In the case of each rear-facing child restraint system, all portions of the test dummy's torso shall be

retained within the system and no portion of the target point on either side of the dummy's head shall pass through the transverse orthogonal planes whose intersection contains the forward-most and top-most points on the child restraint system surfaces (illustrated in Figure 1C).



**Locations of Additional Belt Anchorage Points and Forward Excursion Limit**  
**FIGURE 1B**

**S5.1.3.3 Car beds.** In the case of car beds, all portions of the test dummy's head and torso shall be retained within the confines of the car bed.



**Rear Facing Child Restraint**  
**Forward and Upper Head Excursion Limits**  
**FIGURE 1C**

**S5.1.4 Back support angle.** When a rear-facing child restraint system is tested in accordance with S6.1, the angle between the system's back support surface for the child and the vertical shall not exceed 70 degrees.



**S5.2 Force distribution.**

**S5.2.1 Minimum head support surface—child restraints other than car beds.**

**S5.2.1.1** Except as provided in S5.2.1.2, each child restraint system other than a car bed shall provide restraint against rearward movement of the head of the child (rearward in relation to the child) by means of a continuous seat back which is an integral part of the system and which—

(a) Has a height, measured along the system seat back surface for the child in the vertical longitudinal plane passing through the longitudinal centerline of the child restraint systems from the lowest point on the system seating surface that is contacted by the buttocks of the seated dummy, as follows:

Weight <sup>1</sup> (in pounds)	Height <sup>2</sup> (in inches)
Less than 20 lb.....	18
20 lb or more, but not more than 40 lb.....	20
More than 40 lb.....	22

<sup>1</sup> When a child restraint system is recommended under S5.5 (f) for use by children of the above weights.

<sup>2</sup> The height of the portion of the system seat back providing head restraint shall not be less than the above.

(b) Has a width of not less than 8 inches, measured in the horizontal plane at the height specified in paragraph (a) of this section. Except that a child restraint system with side supports extending at least 4 inches forward from the padded surface of the portion of the restraint system provided for support of the child’s head may have a width of not less than 6 inches, measured in the horizontal plane of the height specified in paragraph (a) of this section.

(c) Limits the rearward rotation of the test dummy head so that the angle between the head and torso of the dummy specified in S7 when tested in accordance with S6.1 is not more than 45 degrees greater than the angle between the head and torso after the dummy has been placed in the system in accordance with S6.1.2.3 and before the system is tested in accordance with S6.1.

**S5.2.1.2** A front facing child restraint system is not required to comply with S5.2.1.1 if the target

point on either side of the dummy’s head is below a horizontal plane tangent to the top of the standard seat assembly when the dummy is positioned in the system and the system is installed on the assembly in accordance with S6.1.2.

**S5.2.2 Torso impact protection.** Each child restraint system other than a car bed shall comply with the applicable requirements of S5.2.2.1 and S5.2.2.2.

**S5.2.2.1** (a) The system surface provided for the support of the child’s back shall be flat or concave and have a continuous surface area of not less than 85 square inches.

(b) Each system surface provided for support of the side of the child’s torso shall be flat or concave and have a continuous surface of not less than 24 square inches for systems recommended for children weighing 20 pounds or more, or 48 square inches for systems recommended for children weighing less than 20 pounds.

(c) Each horizontal cross section of each system surface designed to restrain forward movement of the child’s torso shall be flat or concave and each vertical longitudinal cross section shall be flat or convex with a radius of curvature of the underlying structure of not less than 2 inches.

**S5.2.2.2** Each forward facing child restraint system shall have no fixed or movable surface directly forward of the dummy and intersected by a horizontal line parallel to the SORL and passing through any portion of the dummy, except for surfaces which restrain the dummy when the system is tested in accordance with S6.1.2.1.2 so that the child restraint system shall conform to the requirements of S5.1.2 and S5.1.3.1.

**S5.2.3 Head impact protection.**

**S5.2.3.1** Each child restraint system, other than a child harness, which is recommended under S5.5.2 (f) for children weighing less than 20 pounds shall comply with S5.2.3.2.

**[S5.2.3.2** Each system surface, except for protrusions that comply with S5.2.4, which is contactable by the dummy head when the system is tested in accordance with S6.1 shall be covered with slow recovery, energy absorbing material with the following characteristics:

(a) A 25 percent compression-deflection resistance of not less than 0.5 and not more than 10 pounds per square inch when tested in accordance with S6.3. (45 F.R. 29045. Effective: 5/1/80)】

【(b) A thickness of not less than ½ inch for material having a 25 percent compression-deflection resistance of not less than 1.8 and not more than 10 pounds per square inch when tested in accordance with S6.3. Materials having a 25 percent compression-deflection resistance of less than 1.8 pounds per square inch shall have a thickness of not less than ¾ inch. (45 F.R. 82264—December 15, 1980. Effective: 12/15/80)】

**S5.2.4 Protrusion limitation.** Any portion of a rigid structural component within or underlying a contactable surface, or any portion of a child restraint system surface that is subject to the requirements of S5.2.3 shall, with any padding or other flexible overlay material removed, have a height above any immediately adjacent restraint system surface of not more than ⅜ inch and no exposed edge with a radius of less than ¼ inch.

### **S5.3 Installation.**

**S5.3.1** Each child restraint system shall have no means designed for attaching the system to vehicle seat cushion or vehicle seat back and no component (except belts) that is designed to be inserted between the vehicle seat cushion and vehicle seat back.

**S5.3.2** When installed on a vehicle seat, each child restraint system, other than child harnesses, shall be capable of being restrained against forward movement solely by means of a Type I seat belt assembly (defined in S571.209) that meets Standard No. 208 (S571.208), or by means of a Type I seat belt assembly plus one additional anchorage strap that is supplied with the system and conforms to S5.4.

**S5.3.3 Car beds.** Each car bed shall be designed to be installed on a vehicle seat so that the car bed's longitudinal axis is perpendicular to a vertical longitudinal plane through the longitudinal axis of the vehicle.

### **S5.4 Belts, belt buckles, and belt webbing.**

**S5.4.1 Performance requirements.** The webbing of belts provided with a child restraint system and used to attach the system to the vehicle or to restrain the child within the system shall—

【(a) After being subjected to abrasion as specified in § 5.1(d) or 5.3(c) of FMVSS No. 209 (§ 571.209), have a breaking strength of not less than 75 percent of the strength of the unabraided webbing when tested in accordance with S5.1(b) of FMVSS No. 209. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)】

(b) Meet the requirements of S4.3 (e) through (h) of FMVSS No. 209 (S571.209); and

(c) If contactable by the test dummy torso when the system is tested in accordance with S6.1, have a width of not less than 1½ inches when measured in accordance with S5.4.1.1.

**S5.4.1.1 Width test procedure.** Condition the webbing for 24 hours in an atmosphere of any relative humidity between 48 and 67 percent, and any ambient temperature between 70° and 77° F. Measure belt webbing width under a tension of 5 pounds applied lengthwise.

**S5.4.2 Belt buckles and belt adjustment hardware.** Each belt buckle and item of belt adjustment hardware used in a child restraint system shall conform to the requirements of S4.3 (a) and S4.3 (b) of FMVSS No. 209 (S571.209).

### **S5.4.3 Belt Restraint.**

**S5.4.3.1 General.** Each belt that is part of a child restraint system and that is designed to restrain a child using the system shall be adjustable to snugly fit any child whose height and weight are within the ranges recommended in accordance with S5.5.2 (f) and who is positioned in the system in accordance with the instructions required by S5.6.

**S5.4.3.2 Direct restraint.** Each belt that is part of a child restraint system and that is designed to restrain a child using the system and to attach the system to the vehicle shall, when tested in accordance with S6.1, impose no loads on the child that result from the mass of the system or the mass of the seat back of the standard seat assembly specified in S7.3.



**[S5.4.3.3 Seating systems.** Except for child restraint systems subject to S5.4.3.4, each child restraint system that is designed for use by a child in a seated position and that has belts designed to restrain the child shall, with the test dummy specified in S7 positioned in the system in accordance with S6.1.2.3, provide:

- (a) upper torso restraint in the form of:
  - (i) belts passing over each shoulder of the child; or
  - (ii) a fixed or movable surface that complies with S5.2.2.1(c), and
- (b) lower torso restraint in the form of:
  - (i) a lap belt assembly making an angle between 45° and 90° with the child restraint seating surface at the lap belt attachment points, or
  - (ii) a fixed or movable surface that complies with S5.2.2.1(c), and
- (c) in the case of each seating system recommended for children over 20 pounds, crotch restraint in the form of:
  - (i) a crotch belt connectable to the lap belt or other device used to restrain the lower torso, or
  - (ii) a fixed or movable surface that complies with S5.2.2.1(c). (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)]

**S5.4.3.4 Harnesses.** Each child harness shall:

- (a) Provide upper torso restraint, including belts passing over each shoulder of the child;
- (b) Provide lower torso restraint by means of lap and crotch belt; and
- (c) Prevent a child of any height for which the restraint is recommended for use pursuant to S5.5.2 (f) from standing upright on the vehicle seat when the child is placed in the device in accordance with the instructions required by S5.6.

**S5.4.3.5 Buckle Release.** Any buckle in a child restraint system belt assembly designed to restrain a child using the system shall, when tested in accordance with S6.2, not release when a force of not more than 12 pounds is applied before the test specified in S6.1, and (b) release when a force of not more than 20 pounds is applied after the test specified in S6.1.

## **S5.5 Labeling.**

**S5.5.1** Each child restraint system shall be permanently labeled with the information specified in S5.5.2 (a) through (k).

**S5.5.2** The information specified in paragraphs (a)-(k) of this section shall be stated in the English language and lettered in letters and numbers that are not smaller than 10 point type and are on a contrasting background.

(a) The model name or number of the system.

(b) The manufacturer's name. A distributor's name may be used instead if the distributor assumes responsibility for all duties and liabilities imposed on the manufacturer with respect to the system by the National Traffic and Motor Vehicle Safety Act, as amended

(c) The statement: "Manufactured in ——" inserting the month and year of manufacture.

(d) The place of manufacture (city and State, or foreign country). However, if the manufacturer uses the name of the distributor, then it shall state the location (city and State, or foreign country) of the principal offices of the distributor.

(e) The statement: "This child restraint system conforms to all applicable Federal motor vehicle safety standards."

[(f) One of the following statements, inserting the manufacturer's recommendations for the maximum weight and height of children who can safely occupy the system:

(i) This infant restraint is designed for use by children who weigh \_\_\_\_\_ pounds or less and whose height is \_\_\_\_\_ inches or less; or

(ii) This child restraint is designed for use only by children who weigh between \_\_\_\_\_ and \_\_\_\_\_ pounds and whose height is \_\_\_\_\_ inches or less and who are capable of sitting upright alone; or

(iii) This child restraint is designed for use only by children who weigh between \_\_\_\_\_ and \_\_\_\_\_ pounds and are between \_\_\_\_\_ and \_\_\_\_\_ inches in height. (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)]

(g) The following statement, inserting the location of the manufacturer's installation instruction booklet or sheet on the restraint:

**WARNING! FAILURE TO FOLLOW EACH OF THE FOLLOWING INSTRUCTIONS CAN RESULT IN YOUR CHILD STRIKING THE VEHICLE'S INTERIOR DURING A SUDDEN STOP OR CRASH.**

**SECURE THIS CHILD RESTRAINT WITH A VEHICLE BELT AS SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS LOCATED \_\_\_\_\_.**

(h) In the case of each child restraint system that has belts designed to restrain children using them: **SNUGLY ADJUST THE BELTS PROVIDED WITH THIS CHILD RESTRAINT AROUND YOUR CHILD.**

(i) In the case of each child restraint system which is not intended for use in motor vehicles at



certain adjustment positions, the following statement, inserting the manufacturer's adjustment restrictions.

**DO NOT USE THE \_\_\_\_\_ ADJUSTMENT POSITION(S) OF THIS CHILD RESTRAINT IN A MOTOR VEHICLE.**

(j) In the case of each child restraint system equipped with an anchorage strap, the statement: **SECURE THE TOP ANCHORAGE STRAP PROVIDED WITH THIS CHILD RESTRAINT AS SPECIFIED IN THE MANUFACTURER'S INSTRUCTIONS.**

[(k) In the case of each child restraint system which can be used in a rear-facing position, one of the following statements:

(i) **PLACE THIS CHILD RESTRAINT IN A REAR-FACING POSITION WHEN USING IT WITH AN INFANT; or**

(ii) **PLACE THIS INFANT RESTRAINT IN A REAR-FACING POSITION WHEN USING IT IN THE VEHICLE.** (45 F.R. 29045—May 1, 1980. Effective: 5/1/80)]

(l) An installation diagram showing the child restraint system installed in the right front outboard seating position equipped with a continuous-loop lap/shoulder belt and in the center rear seating position as specified in the manufacturer's instructions.

**S5.5.3** The information specified in S5.5.2 (g)-(k) shall be located on the child restraint system so that it is visible when the system is installed as specified in S5.6.

**S5.6 Installation instructions.** Each child restraint system shall be accompanied by printed instructions in the English language that provide a step-by-step procedure, including diagrams, for installing the system in motor vehicles, securing the system in the vehicles, positioning a child in the system, and adjusting the system to fit the child.

**S5.6.1** The instructions shall state that the rear center seating position is the safest seating position in most vehicles for installing a child restraint system.

**S5.6.2** The instructions shall specify in general terms the types of vehicles, seating positions, and vehicle lap belts with which the system can or cannot be used.

**S5.6.3** The instructions shall explain the primary consequences of noting following the warnings required to be labeled on the child restraint system in accordance with S5.5.2 (g)-(k).

**S5.6.4** The instructions for each car bed shall explain that the car bed should position in such a way that the child's head is near the center of the vehicle.

**S5.6.5** The instructions shall state that child restraint systems should be securely belted to the vehicle, even when they are not occupied, since in a crash an unsecured child restraint system may injure other occupants.

**S5.6.6** Each child restraint system shall have a location on the restraint for storing the manufacturer's instructions.

**S5.7 Flammability.** Each material used in a child restraint system shall conform to the requirements of S4 of FMVSS No. 302 (S571.302).

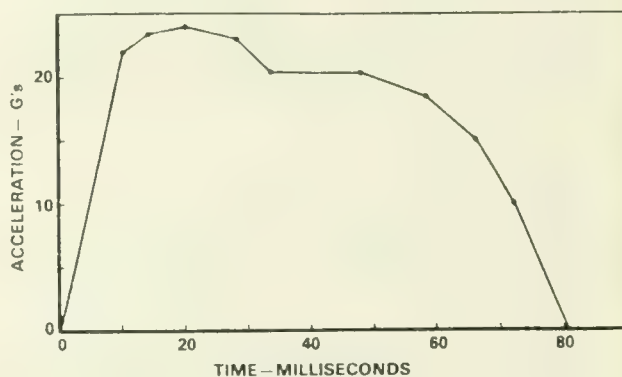
## **S6. Test Conditions and Procedures.**

### **S6.1 Dynamic Systems Test.**

#### **S6.1.1 Test Conditions.**

**S6.1.1.1** The test device is the standard seat assembly specified in S7.3. It is mounted on a dynamic test platform so that the center SORL of the seat is parallel to the direction of the test platform travel and so that movement between the base of the assembly and the platform is prevented. The platform is instrumented with an accelerometer and data processing system having a frequency response of 60Hz channel class as specified in Society of Automotive Engineers Recommended Practice J211a, "Instrumentation for Impact Tests." The accelerometer sensitive axis is parallel to the direction of the test platform travel.

**ACCELERATION FUNCTION FOR  $\Delta V = 30$ MPH.**

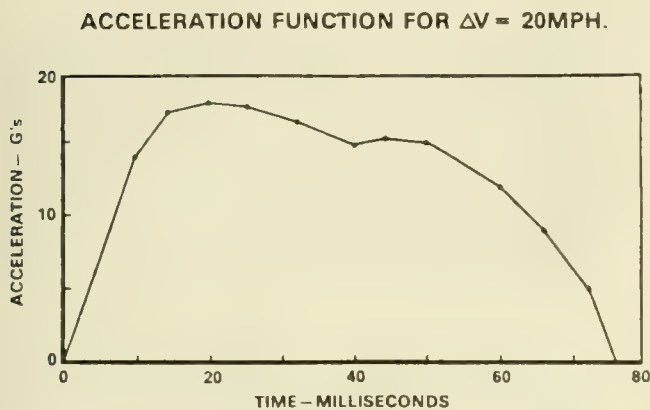


**FIGURE 2**

**S6.1.1.2** The tests are frontal barrier impact simulations and for—

(a) Test configuration I specified in S6.1.2.1.1, are at a velocity change of 30 mph with the acceleration of the test platform entirely within the curve shown in Figure 2.

(b) Test configuration II specified in S6.1.2.1.2, are at a velocity change of 20 mph with the acceleration of the test platform entirely within the curve shown in Figure 3.



**FIGURE 3**

**S6.1.1.3** Type I seat belt assemblies meeting the requirements of Standard No. 209 (S571.209) and having webbing with a width of not more than 2 inches are attached, without the use of retractors or reels of any kind, to the seat belt anchorage points (illustrated in Figure 1B) provided on the standard seat assembly.

**S6.1.1.4** Performance tests under S6.1 are conducted at any ambient temperature from 66° to 78° F and at any relative humidity from 10 percent to 70 percent.

## **S6.1.2 Dynamic Test Procedure.**

### **S6.1.2.1 Test Configuration.**

**S6.1.2.1.1 Test Configuration I.** In the case of each child restraint system, install a new child restraint system at the center seat position of the

standard seat assembly in accordance with the manufacturer's instructions provided in accordance with S5.6 with the system.

**S6.1.2.1.2 Test Configuration II.** In the case of each child restraint system, other than a child harness, which is equipped with an anchorage belt or a fixed or movable surface described in S5.2.2.2, install a new child restraint system at the center seat position of the standard seat assembly using only the standard seat lap belt to secure the system to the standard seat.

**S6.1.2.2** Tighten all belts used to attach the child restraint system to the standard seat assembly to a tension of not less than 12 pounds and not more than 15 pounds, as measured by a load cell used on the webbing portion of the belt.

**S6.1.2.3** Place in the child restraint any dummy specified in S7 for testing systems for use by children of the heights and weights for which the system is recommended in accordance with S5.6.

**S6.1.2.3.1** When placing the 3-year-old test dummy in child restraint systems other than car beds, position the test dummy according to the instructions for child positioning provided by the manufacturer with the system in accordance with S5.6 while conforming to the following:

(a) Place the test dummy in the seated position within the system with the midsagittal plane of the test dummy head coincident with the center SORL of the standard seating assembly, holding the torso upright until it contacts the system's design seating surface.

(b) Extend the arms of the test dummy as far as possible in the upward vertical direction. Extend the legs of the dummy as far as possible in the forward horizontal direction, with the dummy feet perpendicular to the centerline of the lower legs.

(c) Using a flat square surface with an area of 4 square inches, apply a force of 40 pounds, perpendicular to the plane of the back of the standard seat assembly, first against the dummy crotch and then at the dummy thorax in the midsagittal plane of the dummy. For a child restraint system with a fixed or movable surface described in S5.2.2.2 which is being tested under the conditions of test configuration II, do not attach any of the child



restraint belts unless they are an integral part of the fixed or movable surface. For all other child restraint systems and for a child restraint system with a fixed or movable surface which is being tested under the conditions of test configuration I, attach all appropriate child restraint belts and tighten them as specified in S6.1.2.4. Attach all appropriate vehicle belts and tighten them as specified in S6.1.2.2. Position each movable surface in accordance with the manufacturer's instructions provided in accordance with S5.6.

(d) After the steps specified in paragraph (c) of this section, rotate each dummy limb downwards in the plane parallel to its midsagittal plane until the limb contacts a surface of the child restraint system or the standard seat. Position the limbs, if necessary, so that limb placement does not inhibit torso or head movement in tests conducted under S6.

**S6.1.2.3.2** When placing the 6-month-old dummy in child restraint systems other than car beds, position the test dummy according to the instructions for child positioning provided with the system by the manufacturer in accordance with S5.6 while conforming to the following:

(a) With the dummy in the supine position on a horizontal surface, and while preventing movement of the dummy torso by placing a hand on the center of the torso, rotate the dummy legs upward by lifting the feet until the legs contact the upper torso and the feet touch the head, and then slowly release the legs but do not return them to the flat surface.

(b) Place the dummy in the child restraint system so that the back of the dummy torso contacts the back support surface of the system. For a child restraint system with a fixed or movable surface described in S5.2.2.2 which is being tested under the conditions of test configuration II, do not attach any of the child restraint belts unless they are an integral part of the fixed or movable surface. For all other child restraint systems and for a child restraint system with a fixed or movable surface which is being tested under the conditions of test configuration I, attach all appropriate child restraint belts and tighten them as specified in S6.1.2.4. Attach all appropriate vehicle belts and tighten them as specified in S6.1.2.2. Position each movable surface in accordance with the manufacturer's instructions

provided in accordance with S5.6. If the dummy's head does not remain in the proper position, it shall be taped against the front of the seat back surface of the system by means of a single thickness of 1/4-inch-wide paper masking tape placed across the center of the dummy face.

(c) Position the dummy arms vertically upwards and then rotate each arm downward toward the dummy's lower body until it contacts a surface of the child restraint system or the standard seat assembly, ensuring that no arm is restrained from movement in other than the downward direction, by any part of the system or the belts used to anchor the system to the standard seat assembly.

**S6.1.2.3.3** When placing the 6-month-old dummy or 3-year-old dummy in a car bed, place the dummy in the car bed in the supine position with its midsagittal plane perpendicular to the center SORL of the standard seat assembly and position the dummy within the car bed in accordance with instructions for child positioning provided with the car bed by its manufacturer in accordance with S5.6.

**S6.1.2.4** If provided, shoulder and pelvic belts that directly restrain the dummy shall be adjusted as follows:

Tighten the belts until a 2-pound force applied (as illustrated in Figure 5) to the webbing at the top of each dummy shoulder and to the pelvic webbing two inches on either side of the torso midsagittal plane pulls the webbing 1/4 inch from the dummy.

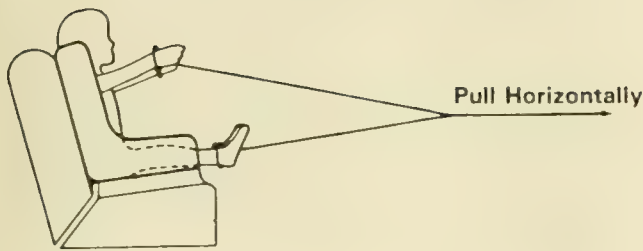
**S6.1.2.5** Accelerate the test platform to simulate frontal impact in accordance with S6.1.1.2 (a) or S6.1.1.2. (b), as appropriate.

**S6.1.2.6** Measure dummy excursion and determine conformance to the requirements specified in S5.1 as appropriate.

**S6.2 Buckle release test procedure.** The buckles on the belts of each child restraint system equipped with buckled belts shall be tested in accordance with S6.2.1 through S6.2.5.

**S6.2.1** Install the child restraint system on a standard seat assembly and place the appropriate test dummy in the system in accordance with S6.1.2.1 through S6.1.2.4.





**Buckle Release Test**  
**FIGURE 4**

**S6.2.2** Tie a self-adjusting sling to each ankle and wrist of the dummy in the manner illustrated in Figure 4.

**S6.2.3** Pull the sling horizontally in the manner illustrated in Figure 4 and parallel to the center SORL of the seat assembly and apply a force of 20 pounds in the case of a system tested with a 6 month-old dummy and 45 pounds in the case of a system tested with a 3 year-old dummy.

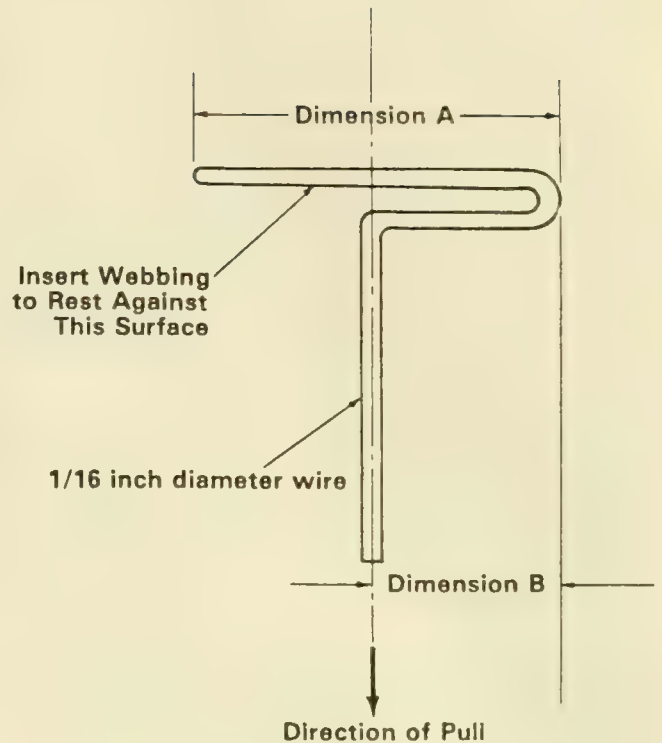
**S6.2.4** While applying the force specified in S6.2.3, operate the buckle release mechanism in the manner specified in S5.2 (d) of Standard No. 209 (S571.209).

**S6.2.5** Measure the force required to release the buckle.

**S6.3 Head impact protection—energy absorbing material test procedure.**

**S6.3.1** Prepare and test specimens of the energy absorbing material used to comply with S5.2.3 in accordance with the applicable 25 percent compression-deflection test described in the American Society for Testing and Materials (ASTM) Standard D1056-73, "Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber", or D1564-71. "Standard Method of Testing Flexible Cellular Materials—Slab Urethane Foam" or D1565-76 "Standard Specification for Flexible Cellular Materials—Vinyl Chloride Polymer and Copolymer open-cell foams.

**S7 Test dummies.**



**Dimension A** - Width of Webbing Plus 1/8 inch  
**Dimension B** - 1/2 of Dimension A

**Webbing Tension Pull Device**  
**FIGURE 5**

**S7.1 Six-month-old dummy.** An unclothed "Six-month-old Size Manikin" conforming to Subpart D of Part 572 of this chapter is used for testing a child restraint system that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing not more than 20 pounds

**S7.2 Three-year-old dummy.** A three-year-old dummy conforming to Subpart C of Part 572 of this chapter is used for testing a child restraint that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing more than 20 pounds.

**S7.2.1** Before being used in testing under this standard, the dummy is conditioned at any

ambient temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent for at least 4 hours.

**S7.2.2** When used in testing under this standard, the dummy is clothed in thermal knit waffle-weave polyester and cotton underwear, a size 4 long-sleeved shirt weighing 0.2 pounds, a size 4 pair of long pants weighing 0.2 pounds and cut off just far enough above the knee to allow the knee target to be visible, and size 7M sneakers with rubber toe caps, uppers of dacron and cotton or nylon and a total weight of 1 pound. Clothing other than the shoes is machine-

washed in 160° F to 180° F water and machine dried at 120° F to 140° F for 30 minutes.

**S7.3 Standard seat assembly.** The standard seat assembly used in testing under this standard is a simulated vehicle bench seat, with three seating positions, which is described in Drawing Package SAD-100-1000 and consists of drawings and a bill of materials.

**44 F.R. 72131  
December 13, 1979**

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 214

### Side Door Strength—Passenger Cars

(Docket No. 2-6; Notice No. 3)

The purpose of this amendment to §571.21 of Title 49, Code of Federal Regulations, is to add a new motor vehicle safety standard that sets minimum strength requirements for side doors of passenger cars. The standard differs in only a few details from the notice of proposed rulemaking published on April 23, 1970 (35 F.R. 6512).

As noted in the proposal of April 23, the percentage of dangerous and fatal injuries in side collisions increases sharply as a maximum depth of penetration increases. With this in mind, the notice of proposed rulemaking stressed the need for a door that offers substantial resistance to intrusion as soon as an object strikes it. The proposal required a door to provide an average crush resistance of 2,500 pounds during the first 6 inches of crush. One comment stated that equivalent protection can be provided by structures further to the interior of the door and that the proper measure of protection is the force needed to deflect the inner door panel rather than that needed to deflect the outer panel. Although inboard mounted structures may be effective in preventing intrusion if the door has a large cross section, with a correspondingly large distance between the protective structure and the inner panel, the standard as issued reflects the determination that doors afford the greatest protection if the crush resisting elements are as close to the outer panel as possible. It follows from this determination that the surface whose crush is to be measured must be the outer panel rather than the inner one. The value specified for the initial crush resistance has, however, been reduced from 2,500 pounds to 2,250 pounds, a value that has been determined to be more appropriate, particularly for lighter vehicles.

Two comments suggested that the crush distance should be the distance traveled by the loading device after an initial outer panel distortion caused by a "pre-load." This suggestion is without merit, in that it would permit use of needlessly light outer panel materials and thereby diminish the distance between the protective elements of the door and the occupants.

The comments revealed a considerable difference of opinion concerning the value and validity of the concept of "equivalent crush resistance." The equivalent crush resistance was to be derived by adding  $\frac{1}{4}$  (3000-W) to the average force required to crush the door 12 inches. It had been thought that the resulting bias against heavier vehicles was necessary in that their greater mass would cause them to move sideways less in a collision than lighter vehicles, with more of the impacting force being absorbed by the door. Recent studies, however, show that occupants of heavier vehicles involved in side collisions generally suffer a lower proportion of serious injuries and fatalities than persons in lighter vehicles. In light of these studies and other information, the standard retains the basic crush resistance requirement, but deletes the weight correction factor. Since it is no longer appropriate to use the term "equivalent crush resistance," in its place the standard employs the phrase "intermediate crush resistance." The slightly lower figure of 3,500 pounds has been substituted for the 3,750 pound force proposed in the notice. The effect of the change is to increase slightly the crush resistance required for vehicles having curb weight less than 1,800 pounds, and to decrease it slightly for vehicles weighing more than 1,800 pounds.



Effective: January 1, 1973

Similar reasoning lies behind a change in the requirement for peak crush resistance. The available information does not support a peak crush requirement that increases indefinitely with increasing vehicle curb weight. The standard therefore sets a ceiling of 7,000 pounds to the requirement that the door have a peak crush resistance of twice the vehicle's curb weight. In effect, the requirement is unchanged from the proposal for vehicles weighing less than 3,500 pounds, and is diminished for vehicles exceeding that weight.

Several comments suggested that the vehicle should be tested with all seats in place, since the seats may provide protection against intrusion in side impacts. It is recognized that proper seat design can contribute to occupant safety. The retention of the seat would, however, introduce a variable into the test procedure whose bearing on safety is not objectively measurable at this time. For this reason, the standard adopts the proposed requirement that the vehicle be tested with its seats removed.

It was suggested that the location of force application should be changed. The location has

been designated to approximate the weakest section of that part of the door structure likely to be struck by another vehicle. The area designated has been found the most appropriate for the bulk of the automobile population.

Effective date: January 1, 1973.

The majority of comments stated that an effective date of September 1, 1971, as initially proposed, would not be feasible. After evaluation of the comments and other information, it has been determined that the structural changes required by the standard will be such that many manufacturers would be unable to meet the standard if the September 1, 1971, effective date were retained. It has been decided that there is good cause for establishing an effective date more than 1 year after issuance of the rule.

In consideration of the above, Standard No. 214 is adopted as set forth below.

Issued on October 22, 1970.

Douglas W. Toms,  
Director.

35 F.R. 16801  
October 30, 1970

## PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 214

### Side Door Strength

(Docket No. 2-6; Notice No. 6)

**ACTION:** Final Rule.

**SUMMARY:** The purpose of this notice is to amend Safety Standard No. 214, *Side Door Strength*, to allow manufacturers the option of leaving the seats in a vehicle while its ability to resist external forces pressing inward on its door is tested. This amendment was proposed by the NHTSA in response to a petition for rulemaking from Volvo of America Corporation (44 FR 33444, June 11, 1979). The change is intended to give manufacturers broader design capabilities for improving the safety of vehicle occupants involved in side impact collisions. The performance levels for the alternative requirements are lower than those specified in the notice of proposed rulemaking, due to the agency's consideration of public comments on that notice.

**EFFECTIVE DATE:** The amendment made by this notice becomes effective upon publication in the FEDERAL REGISTER.

**ADDRESSES:** Any petitions for reconsideration of this rule should refer to the docket number and notice number and be submitted to the National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. William Brubaker, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration. (202-426-2242).

**SUPPLEMENTARY INFORMATION:**

Safety Standard No. 214, *Side Door Strength* (49 CFR 571.214), specifies performance requirements for the side doors of passenger cars to minimize the life-threatening forces caused by intrusion of

objects such as other vehicles, poles and tree trunks into the occupant compartment in side-impact accidents. The standard currently specifies three static crush tests (initial, intermediate and peak) to measure the crush resistance of the side doors. The basis for these tests is that early studies concerning side impact protection demonstrated that, in fatal side collisions, most occupants die because of the door structures collapsing inward on them. The static crush tests are intended to ensure that there are strong door structures to limit this intrusion. Under the peak crush test of the standard, the vehicle door may not be deformed more than 18 inches inward when the door is subjected to a force of 7,000 pounds, or two times the curb weight of the vehicle, whichever, is less.

The existing test procedures of the standard specify that the vehicle seats are to be removed during the crush tests. Although it was recognized when the standard was originally promulgated that proper seat design can also reduce the amount of intrusion of side door structures into the occupant compartment, it was determined that this standard should measure the integrity of door structures alone.

Manufacturers have generally incorporated various types of beams in the outer door panels to provide crush resistance in compliance with the standard. Last year, however, Volvo of America Corporation petitioned the agency to allow vehicle seats to remain in the automobile during the crush resistance tests. Volvo stated that it has developed an advanced side impact protection system that incorporates the vehicle seats as an essential component and dispenses with door beams. Test data indicate that the Volvo design provides side impact protection that is equal to or greater than that provided by current production designs.



In response to Volvo's petition, the agency issued a notice of proposed rulemaking to allow manufacturers to adopt this option (44 FR 33444, June 11, 1979). The notice stated that manufacturers should be encouraged to develop innovative designs for improving side impact protection, particularly designs that will improve vehicle fuel economy because of reduced weight. Although not included in Volvo's petition, the proposal specified higher crush resistance levels for vehicles tested with their seats intact (a 16,000-pound peak force).

The criteria were set at levels intended to assure an equivalent or greater level of protection compared to the existing requirements. Agency data show that the seats of some current models contribute 4 to 5 thousand pounds of crush resistance in addition to the crush resistance provided by the doors themselves. Therefore, the higher performance levels were proposed to ensure that the current level of crush resistance that is being obtained by strong door beams will not be degraded.

Nearly all of the twelve comments received in response to the notice supported the proposal to give manufacturers the option of testing with seats installed in the vehicle. A majority of the commenters objected to the higher crush resistance levels for the alternative procedure, however. Only Volkswagen Corporation stated that the standard should not be amended to allow the option. Following is a discussion of these comments.

The Insurance Institute for Highway Safety stated that the proposed amendment would give auto manufacturers a broader range of design alternatives than they currently have to reduce the likelihood of injuries to occupants of vehicles struck in the side. Most commenters made similar statements. Mercedes-Benz of North America noted that manufacturers would be afforded greater latitude in selecting designs to comply with the standard, without sacrificing occupancy protection, and at the same time could reduce vehicle weight.

While agreeing with the concept of the proposed alternative requirement, a large number of commenters felt the proposed performance criteria were too stringent. Peugeot, as well as the Motor Vehicle Manufacturers Association, stated that the current performance levels should apply whether

the seats are left in the vehicle during testing or not. American Motors Corporation argued that the proposed crush resistance levels for the alternative procedure are significantly more stringent than existing 214 requirements, and that the NHTSA has not identified any safety need to justify this higher level of performance.

The agency does not agree that the performance levels of the standard should be the same whether the seats are left in the vehicle or are removed. As noted in the proposal, current vehicle seat designs often provide four to five thousand pounds of additional crush resistance above that required by the standard. Further, the standard was originally only intended to test the crush resistance of the doors alone. Therefore, if the performance criteria were the same with and without the seats in the vehicle during the test, manufacturers could reduce the current protection provided by their doors without upgrading their vehicles in other areas. Given the large number of fatalities in side impact accidents, the agency is very concerned that such a degradation of vehicle performance not occur under the alternative test procedure. Therefore, it is the agency's position that there is a substantial safety need to assure that the level of protection provided under the alternative procedure is equivalent to or greater than that provided under the existing test procedure.

Several commenters argued that the data and test results relied upon by the agency to establish the crush resistance levels for the alternative procedure are too limited, and that research should be expanded to include tests of other models prior to establishing the criteria. General Motors stated, for example, that the two vehicles used in NHTSA tests may not be representative of other vehicle designs which could exhibit differing door-to-seat interaction.

The agency disagrees with these contentions. Volvo and Ford Motor Company provided the NHTSA with data from tests they conducted with seats and without seats installed in some of their production vehicles. The agency conducted comparable tests on a Plymouth Volare, and the tests included both bench seats and bucket seats. This and other information substantiate that vehicle seats can and do provide much additional resistance to side door intrusion. These data demonstrate that crush resistance levels should be higher if vehicle seats are left installed during the testing in order to maintain the level of protection currently being provided.



Ford Motor Company argued that the proposed higher performance levels were based on limited tests of current production models, and that the higher performance results achieved in those tests represent built-in reserves by manufacturers above the minimum performance requirements of the standard. Ford stated that the crush resistance criteria of the proposed alternative should not be set at this upper level of performance. Other commenters, including Volvo, also argued that the proposed criteria were too high to allow for production variances. General Motors stated that the proposal does not really remove inhibitions to design innovation due to the increased performance requirements of the proposed alternative procedure. Finally, Rolls-Royce Motors urged that the performance criteria be set low enough that the potential weight savings offered by the proposal can be realized in practice.

After considering these comments, the agency has determined that the crush resistance levels for vehicles tested with their seats intact should be somewhat lower than those specified in the proposal. This will allow for production variances and enable manufacturers to build in a margin of protection above the minimum performance requirements specified in the standard.

In its comments, Volvo Corporation suggested that the intermediate crush resistance level should be set at 4,375 pounds (the proposal specified 7,000 pounds) and that peak crush resistance should be set at 12,000 pounds (the proposal specified 16,000 pounds). Volvo stated that tests of its current production cars that have door beams indicate a spread in intermediate crush resistance of approximately 2,000 pounds. The company noted that an intermediate crush resistance level that is twenty-five percent above the existing requirement would compensate for the addition of seats during testing and at the same time allow manufacturers a sufficient margin to comply with the standard. Volvo also stated that since the seats of some current cars add approximately 4,000 to 5,000 pounds of peak of crush resistance, this should be the amount of increase above the existing requirements, i.e., from 7,000 pounds to 12,000 pounds. Although Volvo's preliminary testing of its advanced side impact protection system indicates that the 16,000-pound requirement could be met, the company feels that the margin is not sufficient to allow for production variances.

The agency agrees with Volvo's suggested crush resistance levels, since they should ensure that the level of protection provided under the alternative requirement is at least equivalent to that provided currently. Therefore, these criteria are adopted in this amendment. While it is encouraging that Volvo's advanced system can meet the 16,000-pound peak force specified in the proposal, this may be too high for other manufacturers at the present time, and the agency's primary concern in allowing the alternative test procedure is to avoid any degradation of the protection being provided under the current requirement. The high performance of Volvo's advanced system will be considered very seriously, however, during the planned rulemaking to upgrade side impact protection (an advance notice of proposed rulemaking concerning improving side impact protection was recently issued: 44 FR 70204, December 6, 1979).

As noted above, data indicate that current seat designs contribute approximately 5,000 pounds to the crush resistance capacity of vehicle side structures. Therefore, the 12,000-pound peak force level specified in this amendment will assure the side impact protection is not degraded, but will also allow manufacturers to develop new designs to meet the requirements. As demonstrated by Volvo, manufacturers will be able to develop new side structures and seat designs that will provide over 12,000 pounds of crush resistance without the use of heavy door beams.

Mercedes-Benz of North America commented that the "initial" crush resistance requirement of the proposed alternative should be deleted (paragraph S3.2.1 of the proposal). Mercedes argued that the three-stage static crush tests assign too much significance to the first stage (initial crush resistance), since door reinforcement is necessary primarily to ensure compliance with this initial test. According to Mercedes, the initial resistance is achieved within the first six inches of crush depth (measured at the outer surface of the door), but that this is not more than one-ninth of the total energy absorption when testing without the vehicle seats. When testing with the seats, according to Mercedes, the percentage of energy absorption at the outer surface of the door panel is meaningless with respect to the total energy management and occupant protection.

The agency does not agree with this rationale. The initial crush resistance stage is necessary to

ensure that vehicle doors have at least a minimum of structural integrity. This is particularly important because of the risk of occupant ejection if door hinges and latches separate during an accident, allowing the door to fly open. Although seat design can ameliorate intrusion into the occupant compartment to a certain extent, it is important to coordinate door structure and seat design to achieve the optimum occupant protection. Because of the initial crush resistance requirements, manufacturers may not be able to delete door beams altogether in some models. However, manufacturers will be able to use much lighter beams than are currently being used, without a reduction in overall performance.

Several commenters addressed the seat location specified in the proposed alternative requirement. The proposal provided that vehicles must be able to meet the specified crush resistance levels with the vehicle seats located in any position and at any seat back angle in which they are designed to be adjusted. Volvo's petition had requested that the mid, horizontal seat adjustment position be specified. Volkswagen of America stated that the new proposed test procedure, with the seat in any position of its adjustment range, potentially increases the test effort. Volkswagen argued that manufacturers would have the obligation to determine, by a test series, the most adverse test positions of the seat, and that this would be much more costly than the existing requirement.

While it may be true that requiring a vehicle to comply with the seat in any position to which it can be adjusted will require more effort by manufacturers, the agency has determined that this is a necessary aspect of the new procedure. If the vehicle seats are to be used as an integral part of the side impact protection system, it is important that the protection is provided regardless of where the seat is located along its adjustment range.

General Motors stated in its comments that it is reasonable to require demonstrated performance to assure that the occupant seat will assist in limiting side crush in any normal driving position. However, General Motors stated that the same rationale should not apply to seat back angle, and that the normal riding or driving angle established by the manufacturer should be used for compliance purposes. Volvo's comments agreed with General Motors regarding seat back angle.

The agency does not see a distinction between horizontal seat adjustment and seat back angle adjustment. If a particular seat is designed to be adjusted through a range of seat back angles, the vehicle should be able to comply with the requirement of the standard with the seat back at any of its adjustment angles, for the same reasons as noted above for horizontal adjustment. Further, the agency does not believe that the cost of testing will be substantially different if manufacturers are responsible for compliance with the seat in any adjustment position. Manufacturers, in some cases, may be able to determine the "worst case" position for seat location by engineering judgment and analysis prior to testing the vehicle. If a manufacturer has designed the vehicle seat to be an integral part of the side impact protection system, the manufacturer will likely know which position provides the most support and resistance to intrusion (and which provides the least support).

Of the commenters on the proposal, only Volkswagen Corporation was opposed to the proposed alternative test procedure. Volkswagen stated that the proposed requirement is not in keeping with the original purpose of the standard—to prevent intrusion. The company argued that there is a potential for reduced occupant protection in the case of oblique angle or "side-swipe" crashes since a vehicle with a door structure of inferior strength, as compared to current designs, runs the possible risk of door destruction or separation. Volkswagen noted that this could expose vehicle occupants to the risk of ejection.

While the agency shares Volkswagen's concern that the occupant protection being afforded by current vehicle doors not be lessened, it does not believe that the optional test procedure will result in reduced performance. The higher crush resistance requirements for vehicles tested with their seats installed should ensure that the overall protection currently provided is maintained. Moreover, since the initial crush resistance stage is included in the alternative procedure, in spite of comments that it should be deleted, door structures will have to maintain a certain amount of structural integrity. The 2,250-pound initial crush resistance level will ensure that door hinges and latches are of sufficient strength to preclude separation in most cases. Therefore, the agency



does not believe that the alternative procedure will lead to increased ejections. The agency does believe, however, that both the current requirement and the alternative requirement should be upgraded. As noted earlier, the agency is presently involved in rulemaking regarding such an upgrade of the standard. The agency does not agree with Volkswagen's contention that the proposed test procedure is not aligned with the original purpose of the standard, since it has been demonstrated that effective seat design can substantially reduce intrusion into the occupant compartment.

The notice proposing this amendment specifically requested comments concerning the effect modifications to side door structures (i.e., lighter door beams or deletion of door beams, altogether) might have on vehicle integrity in frontal and front-angular crashes. In response to this request, Rolls-Royce Motors commented that the door beams used in its vehicles have had a negligible effect on vehicle integrity in frontal crashes. The company added that the requirements of Safety Standard No. 208, *Occupant Crash Protection*, will ensure that manufacturers maintain sufficient structural integrity for front-end crashes even with sophisticated vehicle designs achieving the maximum savings in weight.

American Motors Corporation also stated that the various safety standards requiring frontal impact tests will maintain frontal integrity regardless of modifications to side door structures. Volvo provided data from off-set crash tests involving vehicles both with and without door beams. Both vehicles showed deformation characteristics (damage to vehicle structure) that are within the variances found for current production cars. In light of this information and the fact that there are other safety standards to ensure vehicle integrity in frontal impacts, the agency has concluded that the alternative test procedure set forth in this amendment will have no adverse effect on frontal occupant crash protection.

The agency has reviewed this amendment in accordance with the specifications of Executive Order 12044, "Improving Government Regulations," and the Departmental guidelines implementing that order and determined it has no significant

environmental impact and that its economic impact is so minimal as not to require a regulatory evaluation. The amendment will merely provide manufacturers an alternative test procedure for determining compliance with an existing standard. For this reason, also, the agency has determined that an immediate effective date for this amendment is in order.

The engineer and lawyer primarily responsible for the development of this rule are William Brubaker and Hugh Oates, respectively.

In consideration of the foregoing, Safety Standard No. 214 (49 CFR 571.241) is amended as set forth below.

Section S3 (S3 through S3.3) is amended to read as follows and the first sentence of subparagraph S4(a) is deleted.

§ 571.214 Standard No. 214; Side door strength.

\* \* \* \* \*

S3 *Requirements*. Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, S3.1 or S3.2 when any of its side doors that can be used for occupant egress are tested according to S4.

S3.1 With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of S3.1.1 through S3.1.3.

S3.1.1 *Initial Crush Resistance*. The initial crush resistance shall not be less than 2,250 pounds.

S3.1.2 *Intermediate Crush Resistance*. The intermediate crush resistance shall not be less than 3,500 pounds.

S3.1.3 *Peak Crush Resistance*. The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

S3.2 With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of S3.2.1 through S3.2.2.

S3.2.1 *Initial Crush Resistance*. The initial crush resistance shall not be less than 2,250 pounds.



S3.2.2 *Intermediate Crush Resistance.* The intermediate crush resistance shall not be less than 4,375 pounds.

S3.2.3 *Peak Crush Resistance.* The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.

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Issued on March 11, 1980.

Joan Claybrook  
Administrator

**45 F.R. 17015**  
**March 17, 1980**

## MOTOR VEHICLE SAFETY STANDARD NO. 214

### Side Door Strength—Passenger Cars

(Docket No. 2-6; Notice No. 3)

**S1. Purpose and scope.** This standard specifies strength requirements for side doors of a motor vehicle to minimize the safety hazard caused by intrusion into the passenger compartment in a side impact accident.

**S2. Application.** This standard applies to passenger cars.

**S3. Requirements.** Each vehicle shall be able to meet the requirements of either, at the manufacturer's option, S3.1 or S3.2 when any of its side doors that can be used for occupant egress are tested according to S4.

**S3.1** With any seats that may affect load upon or deflection of the side of the vehicle removed from the vehicle, each vehicle must be able to meet the requirements of S3.1.1 through S3.1.3.

**S3.1.1 Initial Crush Resistance.** The initial crush resistance shall be not less than 2,250 pounds.

**S3.1.2 Intermediate Crush Resistance.** The intermediate crush resistance shall not be less than 3,500 pounds.

**S3.1.3 Peak crush resistance.** The peak crush resistance shall not be less than two times the curb weight of the vehicle or 7,000 pounds, whichever is less.

**S3.2** With seats installed in the vehicle, and located in any horizontal or vertical position to which they can be adjusted and at any seat back angle to which they can be adjusted, each vehicle must be able to meet the requirements of S3.2.1 through S3.2.2.

**S3.2.1 Initial Crush Resistance.** The initial crush resistance shall not be less than 2,250 pounds.

**S3.2.2 Intermediate Crush Resistance.** The intermediate crush resistance shall not be less than 4,375 pounds.

**S3.2.3 Peak Crush Resistance.** The peak crush resistance shall not be less than three and one half times the curb weight of the vehicle or 12,000 pounds, whichever is less.

**S4. Test procedures.** The following procedures apply to determining compliance with section S3:

(a) Place side windows in their uppermost position and all doors in locked position. Place the sill of the side of the vehicle opposite to the side being tested against a rigid unyielding vertical surface. Fix the vehicle rigidly in position by means of tiedown attachments located at or forward of the front wheel centerline and at or rearward of the rear wheel centerline.

(b) Prepare a loading device consisting of a rigid steel cylinder or semi-cylinder 12 inches in diameter with an edge radius of one-half inch. The length of the loading device shall be such that the top surface

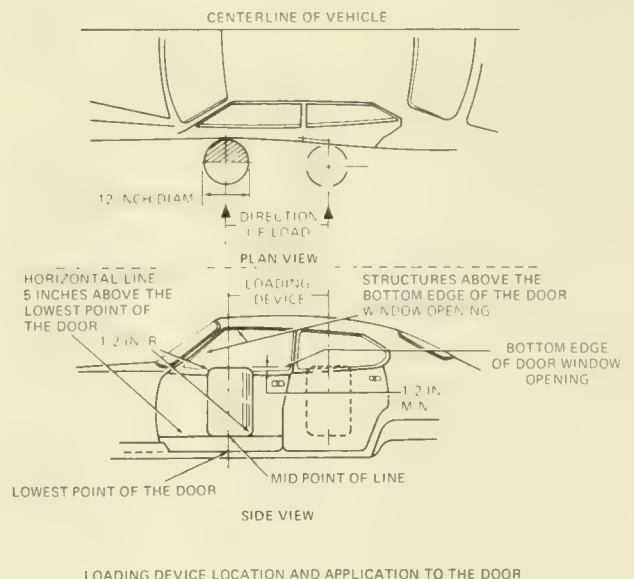


FIGURE 1

of the loading device is at least one-half inch above the bottom edge of the door window opening but not of a length that will cause contact with any structure above the bottom edge of the door window opening during the test.

(c) Locate the loading device as shown in Figure I (side view) of this section so that:

- (1) Its longitudinal axis is vertical;
- (2) Its longitudinal axis is laterally opposite the midpoint of a horizontal line drawn across the outer surface of the door 5 inches above the lowest point of the door;
- (3) Its bottom surface is in the same horizontal plane as the horizontal line described in subdivision (2) of this subparagraph; and
- (4) The cylindrical face of the device is in contact with the outer surface of the door.

(d) Using the loading device, apply a load to the outer surface of the door in an inboard direction normal to a vertical plane along the vehicle's longitudinal centerline. Apply the load continuously such that the loading device travel rate does not exceed one-half inch per second until the loading device travels 18 inches. Guide the loading device to prevent it from being rotated or displaced from its direction of travel. The test must be completed within 120 seconds.

(e) Record applied load versus displacement of the loading device, either continuously or in

increments of not more than 1 inch or 200 pounds for the entire crush distance of 18 inches.

(f) Determine the initial crush resistance, intermediate crush resistance, and peak crush resistance as follows:

(1) From the results recorded in subparagraph (e) of this paragraph, plot a curve of load versus displacement and obtain the integral of the applied load with respect to the crush distances specified in subdivisions (2) and (3) of this paragraph. These quantities, expressed in inch-pounds and divided by the specified crush distances, represent the average forces in pounds required to deflect the door those distances.

(2) The initial crush resistance is the average force required to deform the door over the initial 6 inches of crush.

(3) The intermediate crush resistance is the average force required to deform the door over the initial 12 inches of crush.

(4) The peak crush resistance is the largest force recorded over the entire 18-inch crush distance.

**October 30, 1970**  
**35 F.R. 16801**



# **PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 216**

## **Roof Crush Resistance—Passenger Cars**

**(Docket No. 2-6; Notice 5)**

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard 216, (49 CFR § 571.216) that sets minimum strength requirements for a passenger car roof to reduce the likelihood of roof collapse in a rollover accident. The standard provides an alternative to conformity with the rollover test of Standard 208.

A notice of proposed rulemaking on this subject was issued on January 6, 1971 (36 F.R. 166). As noted in that proposal, the strength of a vehicle roof affects the integrity of the passenger compartment and the safety of the occupants. A few comments suggested that there is no significant causal relationship between roof deformation and occupant injuries in rollover accidents. However, available data have shown that for non-ejected front seat occupants in rollover accidents, serious injuries are more frequent when the roof collapses.

The roof crush standard will provide protection in rollover accidents by improving the integrity of the door, side window, and windshield retention areas. Preserving the overall structure of the vehicle in a crash decreases the likelihood of occupant ejection, reduces the hazard of occupant interior impacts, and enhances occupant egress after the accident. It has been determined, therefore, that improved roof strength will increase occupant protection in rollover accidents.

Standard 208 (49 CFR § 571.208), *Occupant Crash Protection*, also contains a rollover test requirement for vehicles that conform to the "first option" of providing complete passive protection. The new Standard 216 issued herewith

is intended as an alternative to the Standard 208 rollover test, such that manufacturers may conform to either requirement as they choose. Standard 208 is accordingly amended by this notice; the effect of the amendment, together with the new Standard 216, is as follows:

(1) From January 1, 1972, to August 14, 1973, a manufacturer may substitute Standard 216 for the rollover test requirement in the first option of Standard 208; Standard 216 has no mandatory application.

(2) From August 15, 1973, to August 14, 1977, Standard 216 is in effect as to all passenger cars except those conforming by passive means to the rollover test of Standard 208, but it may continue to be substituted for that rollover test.

(3) After August 15, 1977, Standard 216 will no longer be a substitute for the Standard 208 rollover test. It is expected that as of that date Standard 216 will be revoked, at least with respect to its application to passenger cars.

A few comments stated that on some models the strength required in the A pillar could be produced only by designs that impair forward visibility. After review of strengthening options available to manufacturers, the Administration has concluded that a satisfactory increase in strength can be obtained without reducing visibility.

Some comments suggested that the crush limitation be based on the interior deflection of the test vehicle rather than the proposed external criterion. After comparison of the two methods, it has been concluded that a test based on interior deflection would produce results that are significantly less uniform and more difficult to measure, and therefore the requirement based on

**Effective: August 15, 1973**

external movement of the test block has been retained.

Several changes in detail have been made, however, in the test procedure. A number of comments stated that the surface area of the proposed test device was too small, that the 10-degree pitch angle was too severe, and that the 5 inches of padded test device displacement was not enough to measure the overall roof strength. Later data available after the issuance of the NPRM (Notice 4) substantiated these comments. Accordingly, the dimensions of the test block have been changed from 12 inches square to 30 inches by 72 inches, the face padding on the block has been eliminated, and the pitch angle has been changed from 10 degrees to 5 degrees.

Several manufacturers asked that convertibles be exempted from the standard, stating that it was impracticable for those vehicles to be brought into compliance. The Administration has determined that compliance with the standard would pose extreme difficulties for many convertible models. Accordingly, manufacturers of convertibles need not comply with the standard; however, until August 15, 1977, they may comply with the standard as an alternative to conformity with the rollover test of Standard 208.

A few comments objected to the optional 5,000-pound ceiling to the requirement that the roof have a peak resistance of  $1\frac{1}{2}$  times the unloaded vehicle weight. Such objections have some merit, if the energy to be dissipated during a rollover accident must be absorbed entirely by the crash vehicle. In the typical rollover accident, however, in which the vehicle rolls onto the road shoulder, significant amounts of energy are absorbed by the ground. This is particularly true in heavier vehicles. Some of the heavier vehicles, moreover, would require extensive redesign, at a considerably greater cost penalty than in the case of lighter vehicles, to meet a strength requirement of  $1\frac{1}{2}$  times their weight. At the same time, heavier vehicles generally have a lower rollover tendency than do lighter vehicles. On the basis of these factors, it has been determined that an upper limit of 5,000 pounds on

the strength requirement is justified, and it has been retained.

It was requested that the requirement of mounting the chassis horizontally be deleted. It has been determined that the horizontal mounting position contributes to the repeatability of the test procedure and the requirement is therefore retained.

The required loading rate has been clarified in light of the comments. The requirement has been changed from a rate not to exceed 200 pounds per second to a loading device travel rate not exceeding one-half inch per second, with completion of the test within 120 seconds.

A number of manufacturers requested that repetition of the test on the opposite front corner of the roof be deleted. It has been determined that, as long as it is clear that both the left and right front portions of the vehicle's roof structure must be capable of meeting the requirements, it is not necessary that a given vehicle be capable of sustaining successive force applications at the two different locations. The second test is accordingly deleted.

*Effective date:* August 15, 1973. After evaluation of the comments and other information, it has been determined that the structural changes required by the standard will be such that many manufacturers would be unable to meet the requirements if the January 1, 1973 effective date were retained. It has therefore been found, for good cause shown, that an effective date more than one year after issuance is in the public interest. On or after January 1, 1972, however, a manufacturer may substitute compliance with this standard for compliance with the rollover test requirement of Standard 208.

In consideration of the above, the following changes are made in Part 571 of Title 49, Code of Federal Regulations:

1. Standard No. 208, 49 CFR § 571.208, is amended by adding the following sentence at the end of §5.3, *Rollover*: "However, vehicles manufactured before August 15, 1977, that conform to the requirements of Standard No. 216 (§ 571.216) need not conform to this rollover test requirement."

2. A new § 571.216, Standard No. 216 *Roof Crush Resistance*, is added. . . .

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

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Issued on December 3, 1971.

Charles H. Hartman  
Acting Administrator

**36 F.R. 23299**  
**December 8, 1971**





## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 216**

### **Roof Crush Resistance**

**(Docket No. 69-7; Notice 29)**

The purpose of this notice is to postpone the effective date of the requirements of Standards No. 208, Occupant Crash Protection, and 216, Roof Crush Resistance, applicable to the upcoming model year, from August 15, 1973, to September 1, 1973.

The amendment of the effective date was proposed in a notice published July 17, 1973 (38 F.R. 19049), in response to a petition filed by Chrysler Corporation. Chrysler had stated that the build-out of their 1973 models was in danger of running beyond the August 15 date, due to a variety of factors beyond the company's control. In proposing the postponement of the date, the NHTSA noted that the August 15 date had been chosen to coincide with the normal changeover date and that a delay would not appear to have any effect beyond allowing a slightly prolonged build-out.

The two comments submitted in response to the proposal were both favorable. The agency has not discovered any adverse consequences of a delay which would make it inadvisable, and has

therefore decided to postpone the effective date as proposed.

In light of the foregoing, 49 CFR 571.208, Standard No. 208, Occupant Crash Protection, is amended by changing the date of August 14, 1973, appearing in S4.1.1 to August 31, 1973, and by changing the date of August 15, 1973, appearing in S4.1.2 to September 1, 1973. The effective date of 49 CFR 571.216, Standard No. 216, Roof Crush Resistance, is changed from August 15, 1973, to September 1, 1973.

Because this amendment relieves a restriction and imposes no additional burden, an effective date of less than 30 days from the date of issuance is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 10, 1973.

James B. Gregory  
Administrator

**38 F.R. 21930**  
**August 14, 1973**





## MOTOR VEHICLE SAFETY STANDARD NO. 216

### Roof Crush Resistance—Passenger Cars

**S1. Scope.** This standard establishes strength requirements for the passenger compartment roof.

**S2. Purpose.** The purpose of this standard is to reduce deaths and injuries due to the crushing of the roof into the passenger compartment in rollover accidents.

**S3. Application.** This standard applies to passenger cars. However, it does not apply to vehicles that conform to the rollover test requirements (S5.3) of Standard 208 (§ 571.208) by means that require no action by vehicle occupants. It also does not apply to convertibles, except for optional compliance with the standard as an alternative to the rollover test requirements in S5.3 of Standard 208.

**S4. Requirements.** A test device as described in S5 shall not move more than 5 inches, measured in accordance with S6.4, when it is used to apply a force of  $1\frac{1}{2}$  times the unloaded vehicle weight of the vehicle of 5,000 pounds, whichever is less, to either side or the forward edge of a vehicle's roof in accordance with the procedures of S6. Both the left and right front portions of the vehicle's roof structure shall be capable of meeting the requirements, but a particular vehicle need not meet further requirements after being tested at one location.

**S5. Test Device.** The test device is a rigid unyielding block with its lower surface formed as a flat rectangle 30 inches  $\times$  72 inches.

**S6. Test Procedure.** Each vehicle shall be capable of meeting the requirements of S4 when tested in accordance with the following procedure.

**S6.1.** Place the sills or the chassis frame of the vehicle on a rigid horizontal surface, fix the vehicle rigidly in position, close all windows,

close and lock all doors, and secure any convertible top or removable roof structure in place over the passenger compartment.

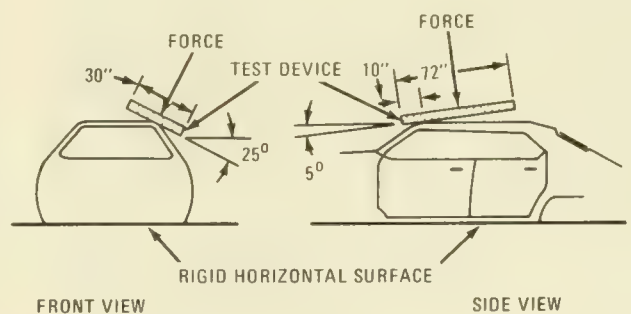
**S6.2** Orient the test device as shown in Figure 1, so that—

(a) Its longitudinal axis is at a forward angle (side view) of  $5^\circ$  below the horizontal, and is parallel to the vertical plane through the vehicle's longitudinal centerline;

(b) Its lateral axis is at a lateral outboard angle, in the front view projection,  $25^\circ$  below the horizontal;

(c) Its lower surface is tangent to the surface of the vehicle; and

(d) The initial contact point, or center of the initial contact area, is on the longitudinal centerline of the lower surface of the test device and 10 inches from the forwardmost point of that centerline.



TEST DEVICE LOCATION AND APPLICATION TO THE ROOF

Figure 1

**S6.3.** Apply force in a downward direction perpendicular to the lower surface of the test device at a rate of not more than one-half inch

per second until reaching a force of 1½ times the unloaded vehicle weight of the tested vehicle or 5,000 pounds, whichever is less. Complete the test within 120 seconds. Guide the test device so that throughout the test it moves, without rotation, in a straight line with its lower surface oriented as specified in S6.2(a) through S6.2(d).

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**S6.4** Measure the distance that the test device moves, *i.e.*, the distance between the original location of the lower surface of the test device and its location as the force level specified in S6.3 is reached.

**36 F.R. 23299**  
**December 8, 1971**

## MOTOR VEHICLE SAFETY STANDARD NO. 217

### Bus Window Retention and Release

(Docket No. 2-10; Notice 3)

The purpose of this amendment to § 571.21 of Title 49, Code of Federal Regulations, is to add a new motor vehicle safety standard that establishes minimum requirements for bus window retention and release to reduce the likelihood of passenger ejection in accidents and enhance passenger exit in emergencies.

A notice of proposed rulemaking on this subject was published on August 15, 1970 (35 F.R. 13025). The comments received in response to the notice have been considered in this issuance of a final rule.

For reasons of clarification, the requirements paragraph has been reorganized and the demonstration procedures paragraph has been replaced by a test conditions paragraph. Some of the specifications of the demonstration procedures paragraph are incorporated under the requirements paragraph, and the remainder are retained under the test conditions paragraph. With the exception of the changes discussed below, the reorganization does not affect the substance of the standard.

In altering the window retention requirements, the final rule lowers the force application limit, provides more precise glazing breakage and glazing yield limits, and exempts small windows. With respect to the emergency exit requirements, the standard permits devices other than push-out windows to be used for emergency exits, permits buses with a GVWR of 10,000 pounds or less to utilize devices other than emergency exits for emergency egress, and permits an alternate roof exit when the bus configuration precludes provision of a rear emergency exit. It also raises the force limits for release and extension of emergency exits, deletes the inertial load requirement for the release mechanism, and requires that emergency exit location markings be lo-

cated within each occupant space adjacent to an exit.

A few changes have been made in the diagram accompanying the standard. Figure 1, "Adjacent Designated Seating Position, Occupant Spaces, and Push-Out Window Relationship," has been deleted from the final rule because the relationship is sufficiently described in the text of the standard. Accordingly, Figures 2 and 3 have been renumbered as Figures 1 and 2, respectively. A new Figure 3, indicating access regions for emergency exits which do not have adjacent seats, has been added. For reasons of clarification, Figures 2a and 2b and Figures 3a and 3b in the proposed rule have been placed beside each other to form Figures 1 and 2 respectively.

The torque in Figures 2a and 2b of the proposed rule has been transferred to the text and has been explained to indicate that the force used to obtain the torque shall not be more than 20 pounds. In addition, the clearance specifications in Figures 1 and 2 have been clarified in the text to require that the lower edge of the force envelope shall be located 5 inches above the seat, or 2 inches above the armrest, if any, whichever is higher. In several instances, minor changes have been made in the labeling without altering the substance of the diagrams.

A number of comments sought changes in the window retention requirements. Two comments requested an exemption for intra-city buses because the probability of rollover accidents would be minimal in slow-speed operation. Urban transit buses are subjected to risks of rollover accidents within the city when they travel at moderate to high speed on intra-urban expressways, and should therefore be covered by the



standard. Accordingly, the request for this exemption is denied.

Several comments requested an exemption for small windows. Since there is little likelihood of passenger ejection or protrusion from window openings whose minimum surface dimension measured through the center of the area is less than eight inches, an exemption for windows of this size has been granted.

Two comments asked that the 2,000 pound force application limit in the window retention requirement be lowered. The data indicates that a 1,200-pound limit would be more compatible with the glazing strength. Accordingly, the 2,000-pound force application limit has been lowered to 1,200 pounds.

Several manufacturers stated that they encountered difficulties in ascertaining when the proposed head form penetration limit of the window retention requirement had been reached. After observation of window retention testing, the NHTSA has concluded that the penetration limit as specified in the notice of proposed rule-making is difficult to determine. For this reason the head form penetration limit has been re-phrased in terms of the development of cracks in the glazing and the amount of depression of the glazing surface in relation to its original position.

A number of comments objected to the requirement that at least 75% of the glazing be retained in the window mounting during window retention testing. The NHTSA has determined that the intent of this requirement is already accomplished by the requirement that each window be retained during testing by its surrounding structure in a manner which would prevent passage of a 4-inch sphere, and the requirement is accordingly deleted from the final rule.

With respect to the emergency exit requirements, the standard permits devices other than push-out windows to be used for emergency exits. Upon review of the requirements, it has been determined that devices such as panels and doors which meet the emergency exit requirements would be as effective as push-out windows for emergency egress. Because the Administration has concluded that passenger egress is enhanced when several emergency exits are pro-

vided, the standard requires that in computing whether a bus meets the unobstructed openings area requirements, no emergency exit, regardless of its area, shall be credited with more than 520 square inches of the total area requirement.

A number of motor vehicle manufacturers sought exemption from the emergency exit requirements for smaller vehicles weighing 10,000 pounds or less GVWR, such as limousines and station wagons, which are designed to carry more than 10 persons and are therefore considered to be buses under NHTSA regulations (49 CFR 571.3). Such vehicles are usually provided with numerous doors and windows which provide sufficient unobstructed openings for emergency exit. Therefore the Administration has concluded that the configuration of these vehicles satisfies the intent of the standard with respect to provision of emergency exits, and they are exempted from the emergency exit openings requirements.

The emergency exit requirements have been changed to permit installation of an alternate roof exit when the bus configuration precludes provision of a rear exit, provided that the roof exit meets the release, extension, and identification requirements. The NHTSA has established this alternative in order to allow design flexibility while providing for emergency egress in rollover situations.

A number of comments expressed concern that the proposed maximum force level for release and extension of emergency exits in Figures 2a and b and 3a and b were too low to inhibit inadvertent operation by passengers and suggested that the required maximum force level be raised. After consideration of the goals of facilitating emergency egress and preserving the integrity of the passenger compartment under normal operation, it has been determined that the maximum force levels should be raised from 10 and 30 pounds to 20 and 60 pounds respectively.

One comment submitted the results of testing which indicated that the 30g inertial load requirement for the release mechanism was unnecessarily high. The testing also revealed that the engineering concepts upon which the inertial load requirement is based are not generally applied in the industry and that the requirement

would be impracticable. Moreover, an increase in maximum force levels for emergency exit operation in the rule should improve latch integrity. For these reasons, the requirement has been deleted.

The standard requires emergency exit location markings to be placed in certain occupant spaces because of a possible contradiction under the proposed standard between the requirement that the identification markings be located within 6 inches of the point of operation and the requirement that the markings be visible to a seated occupant. The NHTSA has concluded that emergency egress could be hindered if the passenger has difficulty in finding the marking, and that location of the marking outside of an occupant space containing an adjacent seat, which would be permitted under the proposed standard, could create this problem. At the same time it is desirable for the identification and instructions to be located near the point of release. Therefore the final rule requires that when a release mechanism is not located within an occupant space containing an adjacent seat, a label indicating the location of the nearest release mechanism shall be placed within that occupant space.

The temperature condition has been reworded to make it clear, in light of the explanation of

usage in § 571.4, that the vehicle must be capable of meeting the performance requirements at any temperature from 70° F. to 85° F.

*Effective date:* September 1, 1973. After evaluation of the comments and other information, it has been determined that the structural changes required by the standard will be such that many manufacturers will require an effective date of at least fifteen months after issuance. It is therefore found, for good cause shown, that an effective date more than one year from the date of issuance is in the public interest.

In consideration of the above, Standard No. 217, Bus Window Retention and Release, is added to § 571.21 of Title 49, Code of Federal Regulations, as set forth below.

This rule is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1401, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on May 3, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 9394**  
**May 10, 1972**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217****Bus Window Retention and Release**

(Docket 2-10; Notice 4)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 217, Bus Window Retention and Release, in § 571.217 of Title 49, Code of Federal Regulations. The standard was issued on May 10, 1972 (37 F.R. 9394).

International Harvester stated that it manufactures an 18-passenger airport limousine, the "Stageway Coach Conversion", weighing 10,700 pounds GVWR and requested that it be exempted from the requirements of S5.2.1, "Buses with GVWR of more than 10,000 pounds." They emphasized that the 18-passenger model is equipped with 10 side doors, two more than is provided by a 15-passenger, 10,000-pound, version of a similar airport limousine vehicle which they manufacture. The NHTSA has concluded that vehicles which provide at least one door for each three passenger seating positions afford sufficient means of emergency egress regardless of their weight. S5.2.1 has accordingly been amended to provide that buses with a GVWR of more than 10,000 pounds may alternatively meet the unobstructed openings requirement of S5.2 by providing at least one door for each three passenger spaces in the vehicle. The "Stageway Coach Conversion" falls into the category of vehicles covered by this amendment and thus International Harvester's request is granted.

International Harvester, General Motors, and Chrysler all requested a clarification of the S5.1 window retention requirements because they felt it was possible to interpret the paragraph as prohibiting the use of tempered glass for window glazing. Ford also submitted a request for exemption from the window retention requirements for buses under 10,000 pounds GVWR based on its interpretation of S5.1 as precluding the use

of tempered glass. The petitioners stated that tempered glass would shatter under the application of pressure required, and were not certain whether S5.1(b), describing the development of cracks in the glazing, would cover this occurrence. The NHTSA did not intend to prohibit the use of tempered glass, and in order to correct this possible ambiguity, S5.1(b) has been amended to include shattering of the window glazing.

General Motors also requested an interpretation of the method of measuring whether 80 percent of the glazing thickness has developed cracks as described in S5.1(b). The paragraph refers to a measurement through the thickness of glass and not a measurement of the glazing surface area, as GM suggests it could mean. GM also doubted that the percentage of glazing thickness which develops cracks could be measured. The NHTSA has determined that the intent of the language is clear and that performance of this measurement is within the state of the art, so that no change in the language is necessary. The request is therefore denied.

General Motors requested a clarification of the term "minimum surface dimension" in paragraph S5.1(c). The NHTSA agrees that a clarification is necessary to prevent interpretations which may not meet the intent of this standard, and the paragraph has been accordingly amended to specify that the dimension is to be measured through the center of the area of the sheet of glazing.

General Motors stated that it interpreted the head form travel rate specified in S5.1.1 of two inches per minute as a "nominal value" requirement, since no tolerances are given in the standard. The test conditions in a safety standard

Effective: September 1, 1973

represent the performance levels that the product must be *capable* of meeting. They are not instructions either to the manufacturers' or the government's test laboratories, or a requirement that the product should be tested at "exactly" those levels. The manufacturers' tests in this case should be designed to demonstrate that the vehicle would meet the stated requirements *if* tested at two inches per minute. If that is what General Motors means by a "nominal value", its interpretation is correct.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 217, Bus Window

Retention and Release, 49 CFR 571.217, is amended....

Effective date: September 1, 1973.

This notice is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1401, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on August 30, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 18034**  
**September 6, 1972**

## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217**

### **Bus Window Retention and Release**

**(Docket No. 2-10; Notice 5)**

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 217, Bus Window Retention and Release, 49 CFR § 571.217, in response to petitions received. Several minor amendments for purposes of clarification have also been made. The standard was published initially on May 10, 1972, (37 F.R. 9394), and amended September 6, 1972 (37 F.R. 18034).

Wayne Corporation has petitioned that the torque limit of 20 inch-pounds for the actuation of rotary emergency exit releases in S5.3.2(a)(3) of the standard is impractical. The Blue Bird Body Company also objected to the requirement, requesting that the limit be raised to 225 inch-pounds in order to avoid inadvertent openings. The NHTSA has decided, based on these petitions, that a maximum torque requirement is redundant, since the force magnitude generally is limited in S5.3.2 to not more than twenty pounds. Accordingly the torque requirement is deleted from the rule.

Blue Bird also requested that Figure 3A, which depicts access region for roof and side emergency exits without adjacent seats in both an upright and overturned bus, be made more explicit.

In response to this request, Figure 3A is being replaced by two figures, one of which depicts

a side emergency exit (Figure 3A), and the other a roof emergency exit (Figure 3B). Existing Figure 3B, depicting access regions for a rear exit with a rear shelf or other obstruction behind the rearmost seat, becomes Figure 3C. A new Figure 3D is added to depict rear seat access regions in buses not having a rear shelf or other obstruction behind the rearmost seat, a configuration common to school buses. Paragraph S5.2.1, regarding provision of emergency exits, is amended to make it clear that a required rear exit must meet the requirements of S5.3 through S5.5 when the bus is overturned on either side, with the occupant standing facing the exit, as well as when the bus is upright.

In consideration of the above, Standard No. 217, Bus Window Retention and Release, 49 CFR 571.217, is amended . . . .

*Effective date:* September 1, 1973.

(Sec. 103, 112, 119, P.L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on February 28, 1973.

Douglas W. Toms  
Administrator

**38 F.R. 6070  
March 6, 1973**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217****Bus Window Retention and Release****(Docket No. 2-10; Notice 7)**

This notice amends Federal Motor Vehicle Safety Standard No. 217, "Bus Window Retention and Release" (49 CFR § 571.217), to exempt from the standard buses manufactured for the purpose of transporting persons under physical restraint. The amendment is based on a notice of proposed rulemaking published October 1, 1973 (38 F.R. 27227), following petitions received from the Bureau of Prisons, United States Department of Justice.

The comments received in response to the proposal agreed that buses manufactured for the specified purpose should not be provided with the emergency exits required by Standard No. 217. The standard specifies that buses contain emergency exits operable by bus occupants, requirements which the NHTSA considers obviously incompatible with the need to transport prison inmates. The National Transportation Safety Board (NTSB) commented, however, that compensatory measures should be taken to minimize the likelihood of fire in prison buses, since the probability of safely evacuating a prison bus is less than that of any other type of bus. The NTSB urged that the exemption be limited to diesel-fueled buses, since diesel fuel is less likely to ignite than gasoline.

The NHTSA recognizes the desirability of minimizing the likelihood of fire in buses. How-

ever, at the present time it is not practical to expect that all newly manufactured prison buses be equipped with diesel engines, given the apparent immediate need for the exemption. Appropriate rulemaking action can be taken in the future if it appears necessary to mitigate from a safety standpoint the loss of emergency exits in prison buses.

In light of the above, paragraph S3 of section 571.217, Title 49, Code of Federal Regulations (Motor Vehicle Safety Standard No. 217), is amended. . . .

Effective date: June 3, 1974. This amendment imposes no additional burdens on any person and relieves restrictions found to be unwarranted. Accordingly, good cause exists and is hereby found for an effective date less than 180 days from the day of issuance.

(Secs. 103, 112, and 119, Pub. L. 89-563; 80 Stat. 718; 15 U.S.C. 1392, 1491, 1407; delegations of authority at 49 CFR 1.51.)

Issued on April 26, 1974.

James B. Gregory  
Administrator

**39 F.R. 15274**  
**May 2, 1974**





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217****Bus Window Retention and Release****(Docket No. 75-6; Notice 2)**

This notice amends Federal Motor Vehicle Safety Standard No. 217, *Bus Window Retention and Release*, 49 CFR 571.217, to clarify the marking requirements for emergency exits on buses. The amendment requires certain markings on all bus emergency exits except manually-operated windows of sufficient size and doors in buses with a GVWR of 10,000 pounds or less.

The amendment was proposed in a notice published April 18, 1975 (40 FR 17266). Comments were received from Chrysler Corporation and General Motors. Chrysler concurred with the proposal. GM, while also concurring, suggested that the wording of the amendment be modified somewhat. The amendment has been reworded to reflect more clearly the intent of this amendment, distinguishing between emergency exits that require markings and those that do not. The NHTSA has determined that special emergency exit markings are unnecessary for doors and manually-operated windows in buses with a GVWR of 10,000 pounds or less. This amendment does not exempt buses with a GVWR of 10,000 pounds or less from complying with the unobstructed openings requirements of S5.2.

It only provides that the openings do not have to be marked as emergency exits. However, specially-installed emergency exits in such buses, such as push-out windows, are not exempted from the marking requirements.

The amendment also allows bus manufacturers the option of designating an emergency door as "Emergency Door" or "Emergency Exit." This will bring Standard No. 217 into conformity with current NHTSA interpretations of the emergency exit marking requirements. However, any emergency exit other than a door must have the designation "Emergency Exit."

Accordingly, S5.5.1 of 49 CFR 571.217, *Bus Window Retention and Release*, is amended . . .

*Effective date:* October 16, 1975.

(Secs. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegations of authority at 49 CFR 1.51).

Issued on October 8, 1975.

Gene G. Mannella  
Acting Administrator

**40 F.R. 48512**  
**October 16, 1975**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

## Bus Window Retention and Release

(Docket NO. 75-3; Notice 2)

This notice amends Federal Motor Vehicle Safety Standard No. 217, *Bus Window Retention and Release*, 49 CFR 571.217, to specify requirements for emergency doors for school buses pursuant to the provisions of section 202 of the Motor Vehicle and Schoolbus Safety Amendments of 1974 (Public Law 93-492, 88 Stat. 1484, 15 U.S.C. 1392). It responds to the congressional mandate to establish standards concerning school bus emergency exits (15 U.S.C. § 1392(i) (1) (A) (i)).

Section 202 requires that certain school bus safety standards be published within 15 months of the passage of the 1974 amendments on October 27, 1974. In addition, these statutory provisions remove the otherwise discretionary authority of the NHTSA to establish lead times for compliance under the general rulemaking provisions of the National Traffic and Motor Vehicle Safety Act by specifying an effective date for the amendment of 9 months from the date of publication of this notice (15 U.S.C. § 1392(i) (1) (B)). The proposed amendments upon which this notice is based were published on February 28, 1975 (40 F.R. 8569).

Many comments were received in response to the proposal to require either one rear emergency door or two side emergency doors in the rear half of the bus passenger compartment. Many objected that the proposal provided for too few emergency doors, and requested requirements for additional side doors and roof exits. Some commenters suggested that push-out windows and the "California" rear exit be required. The agency does not discourage the inclusion of additional emergency exits in school buses so long

as they comply with the requirements applicable to non-school bus emergency exits. The NHTSA believes that "California" rear window emergency exits may be preferable in certain circumstances and proposes in this issue of the Federal Register to amend this rule to permit the use of the "California" rear window along with a side door emergency exit in place of the rear door emergency exit. In the alternative, it is proposed to allow this option only on rear-engine-powered school buses. Under either proposal the requirements of the standard would not be met by providing two sidedoor emergency exits. In addition, the subject of roof exits is being considered and could be the subject of future rulemaking. However, roof exit requirements cannot be included in this rulemaking action because of the statutorily imposed deadline on promulgation of these amendments.

A number of comments were received opposing the proposed interlock requirement on the ground that it would prevent restarting the engine after the school bus stalls in a dangerous intersection or a railroad crossing and panicky passengers jam the release mechanism. The intent of this requirement is to prevent the initial starting of the bus engine until the doors have been unlocked, by a key, combination, or the operation of a remote switch at the beginning of the day. The deletion of the phrase "or otherwise inoperable" excludes inadvertent jamming of the door release mechanism from the requirement. The word "locked" has been defined for this purpose as not releasable at the door except by a key or combination. It would include doors openable by a remote switch.



Six comments supported the proposal to require an audible alarm when the ignition is on and the release mechanism of any emergency door is not closed. Five of these, however, objected that an alarm at each door in addition to one in the driver's compartment would be unnecessary and unduly costly. The NHTSA does not agree. The purpose of audible alarms at each door is to indicate which release mechanism is not closed. This is especially critical while the vehicle is in motion, as it will serve to warn the passengers in the area of the possibility that an emergency door could open. In addition, it will serve as a deterrent to tampering by children with the emergency door release mechanisms. Therefore, the requirement that an audible alarm be positioned at each emergency door and at the driver's position has been retained.

Objectives were received to the requirement that the magnitude of force required to activate the emergency door release mechanism be not more than 40 pounds. The NHTSA does not consider that the 40 pound force limit is too high in light of the location and access requirements of this standard. If the maximum force level were substantially lowered, there would be a significant likelihood that emergency door release mechanisms would be inadvertently activated by a passenger.

In addition, the NHTSA has noted the possibility of ambiguity with respect to the wording of paragraph S5.4 of the old standard and S5.4.2 of the proposal. The intent of these paragraphs is to specify conditions applicable to the opening of the exit *after* the release mechanism has been activated. Accordingly, the wording of the two paragraphs has been modified to clearly reflect this intent.

Many school districts and manufacturers objected to the parallelepiped clearance requirement for the emergency doors because of the number of seats that would be eliminated and the costs of redesigning van-type school buses to meet the clearance requirements. In addition, many commenters pointed out that the 12-inch aisle in most school buses precludes effective use of a large exit meeting the proposed requirements.

The NHTSA has determined that these arguments have merit. As a result, the proposed parallelepiped requirements have been modified by reducing the height from 48 inches to 45 inches, reducing the depth from 24 to 12 inches for rear exits in buses over 10,000 lbs GVWR, and to 6 inches for rear exits in buses under 10,000 lbs GVWR. For side exits the depth has been eliminated altogether. Additionally, the forward edge of the side door now coincides with a vertical transverse plane tangent to the rearmost point of the adjacent seat, thus permitting simultaneous exiting of two occupants, between the seat backs and over the seat cushion.

In light of the above, 49 CFR § 571.217, *Bus Window Retention and Release*, is amended . . . .

*Effective date:* October 26, 1976.

(Secs. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718; Sec. 202, Pub. L. 93-492, 88 Stat. 1484 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 22, 1976.

Howard J. Dugoff  
Acting Administrator  
41 F.R. 3871  
January 27, 1976

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 217

### Bus Window Retention and Release

(Docket No. 75-3; Notice 4)

This notice amends Standard No. 217, *Bus Window Retention and Release*, to modify the emergency exit requirements of the standard in response to a petition for reconsideration of recent amendments and after consideration of comments on the agency's proposal to specify new performance options and labeling for emergency exits.

#### PETITION FOR RECONSIDERATION OF NOTICE 2

The National Highway Traffic Safety Administration (NHTSA) recently amended Standard No. 217 (49 CFR 571.217) to provide emergency exit requirements for school buses (41 FR 3871, January 27, 1976 (Notice 2)). Section S5.2.3.1 of the standard (as it becomes effective for school buses on October 26, 1976) specifies that a rear emergency door shall be hinged on the right side. Chrysler Corporation has petitioned for reconsideration of this provision, asking that a manufacturer option be provided so that the rear emergency door or doors on van-type school buses may be hinged on the right or left.

The purpose of specifying that the rear emergency door hinge to the right is based on the NHTSA finding that school buses often operate on rural highways that are bordered by drainage ditches, and that a school bus that leaves the highway and rolls over is likely to come to rest in the right-hand ditch on its right side. When a bus comes to a rest on its side, the emergency door on the rear of the bus is easier to operate, particularly by small children, if it is hinged so that its operation is assisted by gravity.

Chrysler pointed out that the rear emergency door on van-type school buses is often used routinely for loading and unloading passengers. For this reason, Chrysler offers a single rear

door that hinges at the left side, so that the door swings out of the way to safely accommodate curb-side loading. In the case of larger buses, routine loading and unloading does not occur through the rear emergency door.

The NHTSA agrees with Chrysler that the common practice of curb-side loading through the rear door of van-type school buses justifies a manufacturer option in selecting the side of the door which should be hinged. On balance, the agency considers that the increase in safety for routine curb-side loading through a left-hinged door would outweigh any potential loss of safety benefit for emergency evacuation from a van-type bus that comes to rest on its right side. Accordingly, S5.2.3.1 of the standard is appropriately amended. The agency also takes the opportunity to correct an inadvertent reference to emergency "exit" in S5.2.3.2 when the requirements are actually intended to apply only to an emergency "door."

In a matter unrelated to the Chrysler petition, some uncertainty has arisen over the form of S5.4 as it was revised in Notice 2 to become effective October 26, 1976. Also, the division between buses with a GVWR of 10,000 pounds or less and those with a greater GVWR was imperfectly stated in amending S5.4. For this reason, the amendment of S5.4 is republished in the correct form in this notice. No substantive changes are made in this republication of S5.4.

#### EMERGENCY EXIT AND LABELING PROPOSAL—NOTICE 3

At the time the amendments just discussed were published, the NHTSA published a proposal to clarify certain emergency exit labeling for all buses, and to replace the established option for school bus emergency exits with a new



option (41 FR 3878, January 27, 1976; Notice 3). Comments were received from the Lanai Road Elementary School Parent-Teachers Association, Gillig Brothers (Gillig), Chrysler Corporation, Mr. Allen Braslow, Crown Coach Corporation (Crown), and International Harvester (IH). No comment was received from manufacturers of transit or intercity buses, or from the manufacturers of body-on-chassis school buses. The National Motor Vehicle Safety Council did not comment on this proposal.

With regard to emergency exit labeling, Mr. Braslow suggested two labeling changes intended to assist bus occupants, as well as a requirement for regular testing of emergency exits in buses in highway service. While the latter suggestion lies beyond the authority of the agency under the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1391, et seq.), the agency will consider for future action the suggestion to label all bus exits in the same manner as school bus exits, as well as the suggestion to develop a universal emergency exit insignia with diagrammatic instructions. For the moment, the agency is limited by the extent of its proposal, and accordingly, makes final the changes as proposed.

Standard No. 217 requires (effective October 26, 1976) school buses to provide either a rear emergency door or two side emergency doors in satisfaction of the emergency exit requirements. In Notice 3, the agency proposed to modify this option to require either provision of a rear emergency door or, at the option of the manufacturer, provision of a left-side emergency door and a "California rear window" exit at the rear of the bus. This type of rear window exit provides a large (16 by 48 inch) opening which is more easily utilized than a side emergency door if a bus has rolled onto its side. In the alternative, the agency proposed that the option to use a rear window exit only be allowed in rear-engine buses.

The two manufacturers of transit-type school buses supported the new option, but objected to the alternative proposal that would limit use of the option to rear-engine buses. Both Gillig and Crown build mid-engine school buses with essentially the same configuration as rear-engine buses and consider the rear window exit equally useful in these buses. The agency has considered the

mid-engine design and agrees with the argument made by Crown and Gillig. Accordingly, the agency amends the standard as proposed to apply the option to all school buses. Crown Coach pointed out that the NHTSA proposal to limit rear-window-exit release mechanisms to a single release would necessitate a change in existing hardware. The NHTSA has investigated the available hardware (consisting in all cases of two release mechanisms that are located within 36 inches of each other) and concludes that the only significant safety hazard in some of the designs is that some require simultaneous operation for release. For this reason, the agency will allow not more than two release mechanisms, provided that the two mechanisms do not have to operate simultaneously to effect release. If new designs present a problem of any nature, further rule-making will be undertaken.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16201, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this proposal on the public and private sectors, including possible loss of safety benefits. The option to hinge some rear emergency doors on the right or left, and the option to use a "California rear window" do not involve additional expenditures. The agency estimates that these additional exit arrangements will not significantly reduce the level of safety provided in the affected bus categories. The new requirements for more specific operating instructions for school bus emergency exits are calculated to involve annual costs of about \$67,000. Although the agency is unable to quantify the benefit of clearer exit labeling, it is estimated that better instructions will serve to reduce the possibility of death and injury involved in an attempt to use the emergency exits. Therefore, the agency concludes that the amendments should issue as set forth in this notice.

For the benefit of interested persons, it is noted that Docket 75-6 concerning labeling of bus emergency exits is related to this rulemaking.

In consideration of the foregoing, Standard No. 217 (49 CFR 571.217) as it is amended to become effective for school buses on October 26, 1976, is revised. . . .



*Effective date:* October 26, 1976. The effective date of the amendments numbered 1, 2, 3 and 5 is established as 9 months after the date of issuance of the amendments on which they are based, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, section 202 (15 U.S.C. 1397(i)(1)(A)). The effective date of the amendment numbered 4 is also established as October 26, 1976, although a manufacturer can meet the requirements at an earlier date if the manufacturer so chooses.

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(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on May 25, 1976.

James B. Gregory  
Administrator

**41 F.R. 22356**  
**June 3, 1976**



## MOTOR VEHICLE SAFETY STANDARD NO. 217

### Bus Window Retention and Release

**S1. Scope.** This standard establishes requirements for the retention of windows other than windshields in buses, and establishes operating forces, opening dimensions, and markings for push-out bus windows and other emergency exits.

**S2. Purpose.** The purpose of this standard is to minimize the likelihood of occupants being thrown from the bus and to provide a means of readily accessible emergency egress.

**S3. Application.** This standard applies to buses, except buses manufactured for the purpose of transporting persons under physical restraint.

#### **S4. Definitions.**

"Push-out window" means a vehicle window designed to open outward to provide for emergency egress.

"Adjacent seat" means a designated seating position located so that some portion of its occupant space is not more than 10 inches from an emergency exit, for a distance of at least 15 inches measured horizontally and parallel to the exit.

"Occupant space" means the space directly above the seat and footwell, bounded vertically by the ceiling and horizontally by the normally positioned seat back and the nearest obstruction of occupant motion in the direction the seat faces.

#### **S5. Requirements.**

**S5.1 Window Retention.** Except as provided in S5.1.2, each piece of window glazing and each surrounding window frame, when tested in accordance with the procedure in S5.1.1 under the conditions of S6.1 through S6.3, shall be retained by its surrounding structure in a manner that prevents the formation of any opening large enough to admit the passage of a 4-inch diameter sphere under a force, including the weight of

the sphere, of 5 pounds until any one of the following events occurs:

(a) A force of 1200 pounds is reached.

(b) At least 80% of the glazing thickness has developed cracks running from the load contact region to the periphery at two or more points, or shattering of the glazing occurs.

(c) The inner surface of the glazing at the center of force application has moved relative to the window frame, along a line perpendicular to the undisturbed inner surface, a distance equal to one-half of the square root of the minimum surface dimension measured through the center of the area of the entire sheet of window glazing.

**S5.1.1** An increasing force shall be applied to the window glazing through the head form specified in Figure 4, outward and perpendicular to the undisturbed inside surface at the center of the area of each sheet of window glazing, with a head form travel of 2 inches per minute.

**S5.1.2** The requirements of this standard do not apply to a window whose minimum surface dimension measured through the center of its area is less than 8 inches.

**S5.2 Provision of Emergency Exits.** Buses other than school buses shall provide unobstructed openings for emergency exit which collectively amount, in total square inches, to at least 67 times the number of designated seating positions on the bus. At least 40 percent of the total required area of unobstructed openings, computed in the above manner, shall be provided on each side of a bus. However, in determining the total unobstructed openings provided by a bus, no emergency exit, regardless of its area, shall be credited with more than 536 square inches of the total area requirement. School



buses shall provide openings for emergency exits that conform to S5.2.3.

**S5.2.1 Buses with GVWR of more than 10,000 pounds.** Except as provided in S5.2.1.1, buses with a GVWR of more than 10,000 pounds shall meet the unobstructed openings requirements by providing side exits and at least one rear exit that conforms to S5.3 through S5.5. The rear exit shall meet the requirements when the bus is upright and when the bus is overturned on either side, with the occupant standing facing the exit. When the bus configuration precludes installation of an accessible rear exit, a roof exit that meets the requirements of S5.3 through S5.5 when the bus is overturned on either side, with the occupant standing facing the exit, shall be provided in the rear half of the bus.

**S5.2.1.1** A bus with GVWR of more than 10,000 pounds may satisfy the unobstructed openings requirement by providing at least one side door for each three passenger seating positions in the vehicle.

**S5.2.2** Buses with a GVWR of 10,000 pounds or less. Buses with a GVWR of 10,000 pounds or less may meet the unobstructed openings requirement by providing:

(a) Devices that meet the requirements of S5.3 through S5.5 without using remote controls or central power systems;

(b) Windows that can be opened manually to a position that provides an opening large enough to admit unobstructed passage, keeping a major axis horizontal at all times, of an ellipsoid generated by rotating about its minor axis an ellipse having a major axis of 20 inches and a minor axis of 13 inches; or

(c) Doors.

### **S5.2.3 School buses.**

**S5.2.3.1** Each school bus shall comply with either one of the following minimum emergency exit provisions, chosen at the option of the manufacturer:

(a) One rear emergency door that opens outward and is hinged on the right side (either side in the case of a bus with a GVWR of 10,000 pounds or less); or

(b) One emergency door on the vehicle's left side that is in the rear half of the bus passenger compartment and is hinged on its forward side, and a push-out rear window that provides a minimum opening clearance 16 inches high and 48 inches wide. This window shall be releasable by operation of not more than two mechanisms which are located in the high force access region as shown in Figure 3C, and which do not have to be operated simultaneously. Release and opening of the window shall require force applications, not to exceed 40 pounds, in the directions specified in S5.3.2.

**S5.2.3.2** The engine starting system of a school bus shall not operate if any emergency door is locked from either inside or outside the bus. For purposes of this requirement, "locked" means that the release mechanism cannot be activated by a person at the door without a special device such as a key or special information such as a combination.

### **S5.3 Emergency exit release.**

**S5.3.1** Each push-out window or other emergency exit not required by S5.2.3 shall be releasable by operating one or two mechanisms located within the regions specified in Figure 1, Figure 2, or Figure 3. The lower edge of the region in Figure 1, and Region B in Figure 2, shall be located 5 inches above the adjacent seat, or 2 inches above the armrest, if any, whichever is higher.

**S5.3.2** When tested under the conditions of S6, both before and after the window retention test required by S5.1, each emergency exit not required by S5.2.3 shall allow manual release of the exit by a single occupant using force applications each of which conforms, at the option of the manufacturer, either to (a) or (b). The release mechanism or mechanisms shall require for release one or two force applications, at least one of which differs by 90 to 180° from the direction of the initial push-out motion of the emergency exit (outward and perpendicular to the exit surface).

(a) Low-force application.

*Location:* As shown in Figure 1 or Figure 3.

*Type of Motion:* Rotary or straight.

*Magnitude:* Not more than 20 pounds.

(b) High force application.

*Location:* As shown in Figure 2 or Figure 3.

*Type of Motion:* Straight, perpendicular to the undisturbed exit surface.

*Magnitude:* Not more than 60 pounds.

**S5.3.3** When tested under the conditions of S6., both before and after the window retention test required by S5.1, each school bus emergency door shall allow manual release of the door by a single person, from both inside and outside the bus passenger compartment, using a force application that conforms to paragraphs (a) through (c). Each release mechanism shall operate without the use of remote controls or tools, and notwithstanding any failure of the vehicle's power system. When the release mechanism is not in the closed position and the vehicle ignition is in the "on" position, a continuous warning sound shall be audible at the driver's seating position and in the vicinity of the emergency door having the unclosed mechanism.

(a) Location: Within the high force access region shown in Figure 3A for a side emergency door, and in Figure 3D for a rear emergency door.

(b) Type of motion: Upward from inside the bus; at the discretion of the manufacturer from outside the bus.

(c) Magnitude of force: Not more than 40 pounds.

The present S5.4 is renumbered S5.4.1, and the phrase "Each push-out window or other emergency exit shall, after the release mechanism has been operated," is replaced by the phrase "After the release mechanism has been operated, each push-out window or other emergency exit not required by S5.2.3," at the beginning of the paragraph.

**S5.4 Emergency exit extension.**

**S5.4.1** After the release mechanism has been operated, each push-out window or other emergency exit not required by S5.2.3 shall, under the conditions of S6, before and after the window retention test required by S5.1, using the reach distances and corresponding force levels specified in S5.3.2, be manually extendable by a single occupant to a position that provides an opening large enough to admit unobstructed passage, keeping a major axis horizontal at all times, of an ellipse

generated by rotating about its minor axis an ellipse having a major axis of 20 inches and a minor axis of 13 inches.

**S5.4.2 School bus emergency exit extension.**

**S5.4.2.1 School bus with a GVWR of more than 10,000 pounds.** After the release mechanism has been operated, the emergency door of a school bus with a GVWR of more than 10,000 pounds shall, under the conditions of S6, before and after the window retention test required by S5.1, using the force levels specified in S5.3.3, be manually extendable by a single person to a position that permits—

(a) In the case of rear emergency door, an opening large enough to permit unobstructed passage of a rectangular parallelepiped 45 inches high, 24 inches wide, and 12 inches deep, keeping the 45-inch dimension vertical, the 24-inch dimension parallel to the opening, and the lower surface in contact with the floor of the bus at all times; and

(b) In the case of a side emergency door, an opening at least 45 inches high and 24 inches wide. A vertical transverse plane tangent to the rear-most point of a seat back shall pass through the forward edge of a side emergency door.

**S5.4.2.1 School Buses Less Than 10,000 Pounds or Less.** A school bus with a GVWR of 10,000 pounds or less shall conform to all the provisions of S5.4.2 except that the parallelepiped dimension for the opening of the rear emergency door or doors shall be 45 inches high, 24 inches wide, and 6 inches deep.

**S5.5 Emergency exit identification.**

**S5.5.1** In buses other than school buses, except for windows serving as emergency exits in accordance with S5.2.2(b) and doors in buses with a GVWR of 10,000 pounds or less, each emergency door shall have the designation "Emergency Door" or "Emergency Exit" and each push-out window or other emergency exit shall have the designation "Emergency Exit" followed by concise operating instructions describing each motion necessary to unlatch and open the exit, located within 6 inches of the release mechanism.



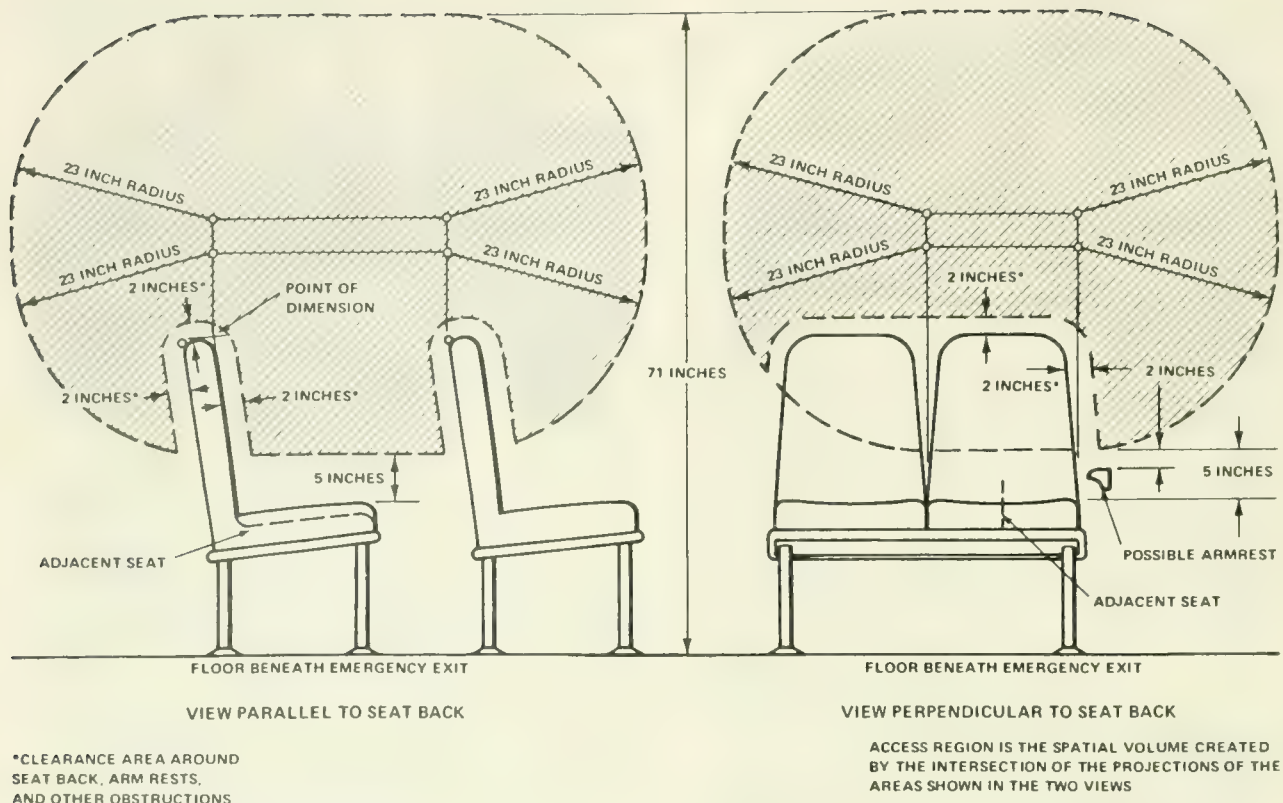


FIGURE 1 LOW-FORCE ACCESS REGION FOR EMERGENCY EXITS HAVING ADJACENT SEATS

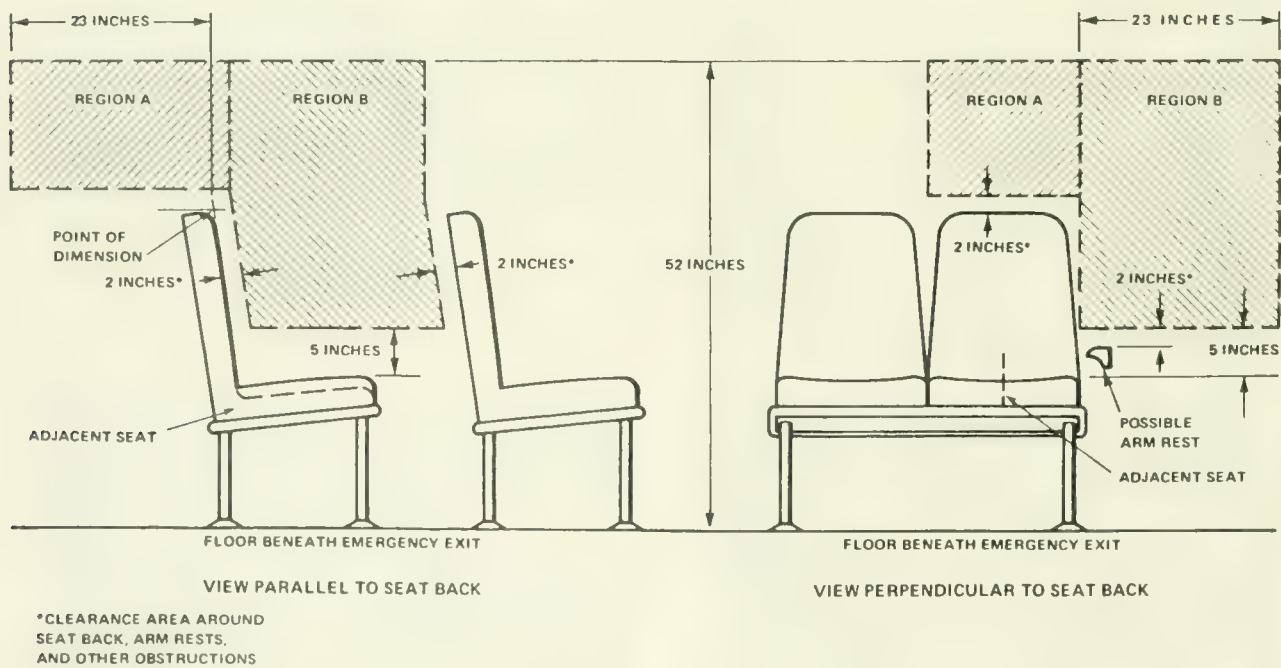
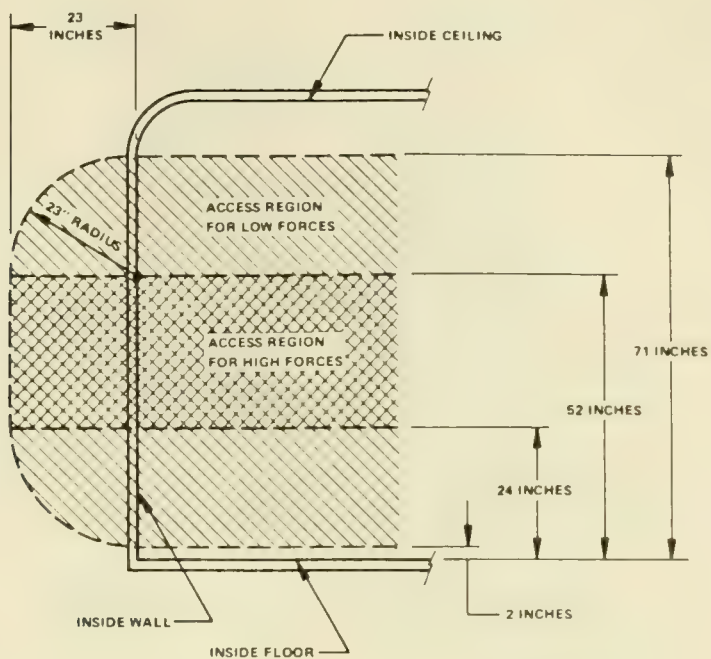


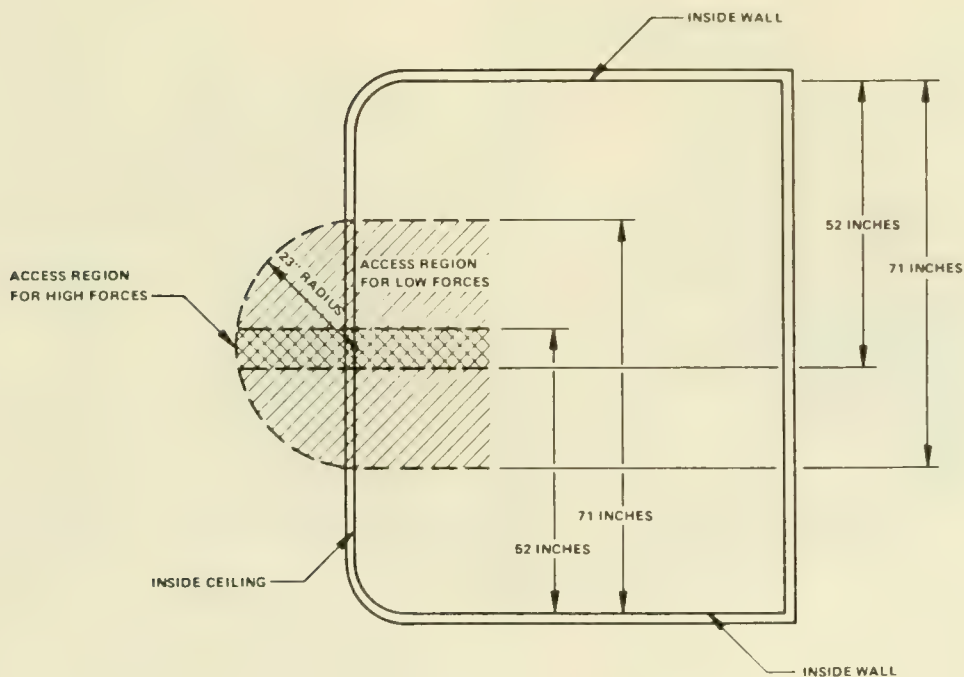
FIGURE 2 HIGH-FORCE ACCESS REGIONS FOR EMERGENCY EXITS HAVING ADJACENT SEATS



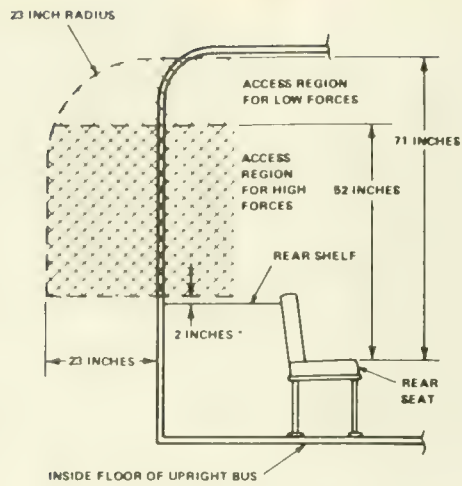
# LOW AND HIGH-FORCE ACCESS REGIONS FOR EMERGENCY EXITS WITHOUT ADJACENT SEATS



3A. SIDE EMERGENCY EXIT

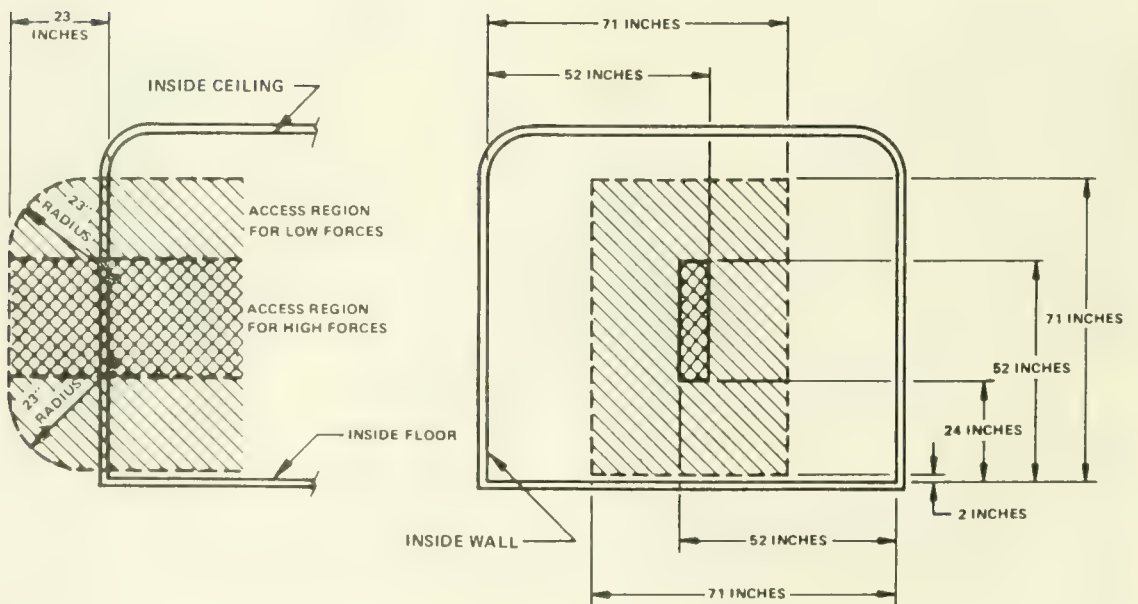


3B. ROOF EMERGENCY EXIT



\*TYPICAL CLEARANCE AROUND OBSTRUCTIONS

### 3C. REAR EMERGENCY EXIT WITH REAR OBSTRUCTION



### 3D. REAR EMERGENCY EXIT WITHOUT REAR OBSTRUCTION

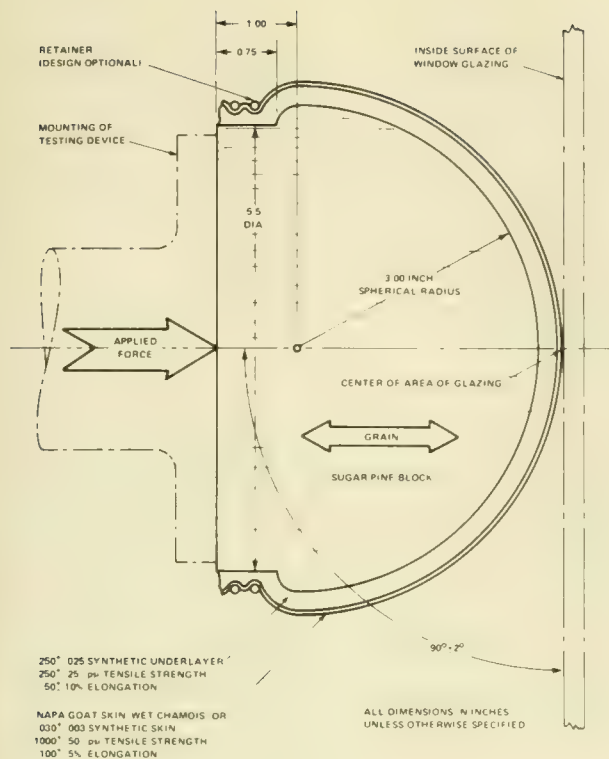


FIGURE 4 HEAD FORM

- Examples: (1) Lift to Unlatch  
Push to Open
- (2) Lift Handle and  
Push out to Open

When a release mechanism is not located within an occupant space of an adjacent seat, a label meeting the requirements of S5.5.2 that indicates the location of the nearest release mechanism shall be placed within the occupant space.

Example: Emergency exit instructions located next to seat ahead.

**S5.5.2** In buses other than school buses, except as provided in S5.5.2.1, each marking shall be legible, when the only source of light is the normal night-time illumination of the bus interior, to occupants having corrected visual acuity of 20/40 (Snellen ratio) seated in the adjacent seat, seated in the seat directly adjoining the adjacent seat, and standing in the aisle location that is closest to that adjacent seat. The marking shall be legible from each of these locations when the other two corresponding locations are occupied.

**S5.5.2.1** If the exit has no adjacent seat, the marking must meet the legibility requirements of S5.5.2 for occupants standing in the aisle location nearest to the emergency exit, except for a roof exit, which must meet the legibility requirements for occupants positioned with their backs against the floor opposite the roof exit.

**S5.5.3 School Bus.** Each school bus emergency exit provided in accordance with S5.2.3.1 shall have the designation "Emergency Door" or "Emergency Exit," as appropriate, in letters at least 2 inches high, of a color that contrasts with its background, located at the top of or directly above the emergency exit on both the inside and outside surfaces of the bus. Concise operating instructions describing the motions necessary to unlatch and open the emergency exit, in letters at least three-eighths of an inch high, of a color that contrasts with its background, shall be located within 6 inches of the release mechanism on the inside surface of the bus.

- Example: (1) Lift to Unlatch  
Push to Open
- (2) Lift Handle  
Push Out to Open.

## S6. Test conditions.

**S6.1** The vehicle is on a flat, horizontal surface.

**S6.2** The inside of the vehicle and the outside environment are kept at any temperature from 70° to 85° Fahrenheit for 4 hours immediately preceding the tests, and during the tests.

**S6.3** For the window retention test, windows are installed, closed, and latched (where latches are provided) in the condition intended for normal bus operation.

**S6.4** For the emergency exit release and extension tests, windows are installed as in S6.3, seats, armrests, and interior objects near the windows are installed as for normal use, and seats are in the upright position.

37 F.R. 9394  
May 10, 1972





## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 218

### Motorcycle Helmets

(Docket No. 72-6; Notice 2)

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard No. 218, Motorcycle Helmets, 49 CFR § 571.218, that establishes minimum performance requirements for motorcycle helmets manufactured for use by motorcyclists and other motor vehicle users.

A notice of proposed rulemaking on this subject was published on May 19, 1972 (37 F.R. 10097). The comments received in response to the notice have been carefully considered in this issuance of a final rule.

In the previous notice, the NHTSA proposed that, effective September 1, 1974, the performance levels for the impact attenuation requirements be upgraded to that of the Head Injury Criterion (HIC) required by Motor Vehicle Safety Standard No. 208. A number of comments on this subject sought to defer a final determination until further research and additional tests could be conducted. The agency has carefully reviewed the issues raised by these comments and has determined that technical data presently being generated on this matter by several investigations should be considered in upgrading the impact attenuation requirements. Accordingly, a decision on the upgrading will be deferred until after this research has been completed and the results evaluated, and after any appropriate data have been reviewed.

Comments to the docket on the initial impact attenuation requirement ranged from abolishing the time duration criteria of 2.0 milliseconds and 4.0 milliseconds at the 200g and 150g levels, respectively, to increasing these criteria to 2.8 milliseconds at the 200g level and 5.6 milliseconds at the 150g level. One approach taken in regard to this requirement contends that the available test data are insufficient for quantifying time

limits for the relatively short duration accelerations which are involved in helmet testing. Several comments questioned the validity of the proposed time duration limits, since these limits were based on the optional swing-away (as opposed to fixed anvil) test of the American National Standards Institute (ANSI) Standard Z90.1-1966, which was omitted from the most recent issues of the Z90.1 Standard (1971 and 1973) and was not contained in the proposed motorcycle helmet standard. An additional comment points out that helmets designed to meet higher energy impacts than the initial impact attenuation requirement occasionally have difficulty meeting a 2.0 millisecond requirement at the 200g level.

A review of available biomechanical data indicates that the head impact exposure allowed by the 2.0 and 4.0 millisecond limits at the 200g and 150g levels, respectively, is greater than that allowed by other measures of head injury potential. It is the agency's view, moreover, that the best evidence indicates that an increase in the time duration criteria would permit a substantial reduction in the protection provided to the helmet wearer. Since the comments to the docket did not provide any new data or sufficiently compelling arguments which would justify relaxing the proposed limits for tolerable head impact exposure, the 2.0 and 4.0 millisecond criteria are retained as part of the initial impact attenuation criteria.

In response to comments recommending that the allowable weight of the supporting assembly for the impact attenuation drop test be changed to 20% instead of the proposed 10% of the weight of the drop assembly, the NHTSA has determined that such a change would enable more durable testing equipment to be used with-

out any significant effect on test results. Accordingly, this weight limitation has been raised to 20%.

Several comments expressed concern that the proposed 0.04-inch indentation limit included under the penetration test would create problems of measurement. The agency has determined that the intent of this 0.04-inch indentation limit is sufficiently accomplished by the requirement that the striker not contact the surface of the test headform, and the 0.04-inch indentation limit is therefore deleted from the final rule. Further, in consideration of the need to readily detect any contact by the striker, the agency has determined that the contactable surfaces of the penetration test headforms should be constructed of a metal or metallic alloy which will insure detection. Several minor changes in the test conditions for the penetration test have also been made, without altering the substance of those conditions.

A number of comments recommended that where the retention system consists of components which can be independently fastened without securing the complete assembly, such components should not have to individually meet the retention test requirements. Since helmets have a tendency to be thrown off by a crash and motorcyclists sometimes only partially fasten the retention system where such an option exists, the agency has concluded that retention components as well as the entire assembly should meet the test requirements in every fastening mode as specified in the notice of proposed rulemaking.

A number of comments requested that the 105° minimum peripheral vision clearance to each side of the midsagittal plane be increased to 120°. The 105° minimum requirement was proposed because it satisfies a demand by the public for the availability of some helmets which provide added protection to the temporal areas in exchange for a minimal reduction in peripheral vision capability without compromising the safe limits of peripheral vision clearance. A review of available field-of-vision studies and the lack of any evidence to the contrary indicate that 105° minimum clearance to each side of the midsagittal plane provides ample peripheral vision capability. Since the requests for increasing the

minimum clearance to 120° were not accompanied by any supporting data or arguments, the agency has concluded that the standard should allow the additional protection which the 105° minimum clearance would permit and, accordingly, this requirement is retained.

With respect to providing important safety information in the form of labeling, one comment recommended that, due to possible label deterioration, both the manufacturer's identification and the helmet model designation should be permanently marked by etching, branding, stamping, embossing, or molding on the exterior of the helmet shell or on a permanently attached component so as to be visible when the helmet is in use. The NHTSA has determined that the practical effect of this recommendation is accomplished by requiring each helmet to be permanently and legibly labeled. The method to be used to permanently and legibly affix a label for each helmet is therefore left to the discretion of the manufacturer. However, in order that there may be some external, visual evidence of conformity to the standard, the labeling requirement has been further modified to require manufacturer certification in the form of the DOT symbol to appear in permanent form on the exterior of the helmet shell.

One comment recommended that the preliminary test procedures include the application of a 10-pound static test load to the apex of a helmet after it is placed on the reference headform and before the "test line" is drawn to insure that the reference marking will be relatively uniform, thus reducing variances in test results of identical helmets. The agency concurs in this recommendation and it has been included in the standard.

A number of comments objected to the location of the test line. With respect to the proposed requirement that the test line on the anterior portion of a helmet coincide with the reference plane of its corresponding reference headform, it was pointed out that the helmet's brow area would have to be excessively thick in order to meet the impact attenuation criteria at any point less than approximately 1 inch from the brow opening. The data indicate that this objection is valid, and the location of the anterior



test line has been modified by placing it 1 inch above and parallel to the reference plane.

A number of comments objected to the proposed requirement that the test line on the posterior portion of a helmet coincide with the basic plane of its corresponding reference headform. The principal objection expressed concern that, by extending the posterior test line to the basic plane, the resulting increase in the posterior surface of a helmet could cause the helmet to impact the wearer's neck where rearward rotation of the head occurs, thereby increasing the potential for injury in certain cases. After further consideration of this aspect of helmet safety, the agency has determined that the location of the test line on the posterior portion of a helmet should be modified by placing it 1 inch below and parallel to the reference plane.

Several comments questioned the sufficiency of the anatomical dimensions and diagrams provided for the reference headforms in the Appendix of the notice of proposed rulemaking. Of these comments, two proposed adopting the dimensional specifications of the existing ANSI Z90.1 headform, while a third recommended the

inclusion of an additional reference headform to accommodate their smallest child helmet. The agency has concluded that, in order to promote greater uniformity in testing and more repeatable results, one of the reference headforms should have the dimensional specifications of the readily available Z90.1 headform, the others being scaled proportionally, and that a reference headform for smaller child helmets should be added. Accordingly, the Appendix has been revised to reflect these changes.

*Effective date:* March 1, 1974.

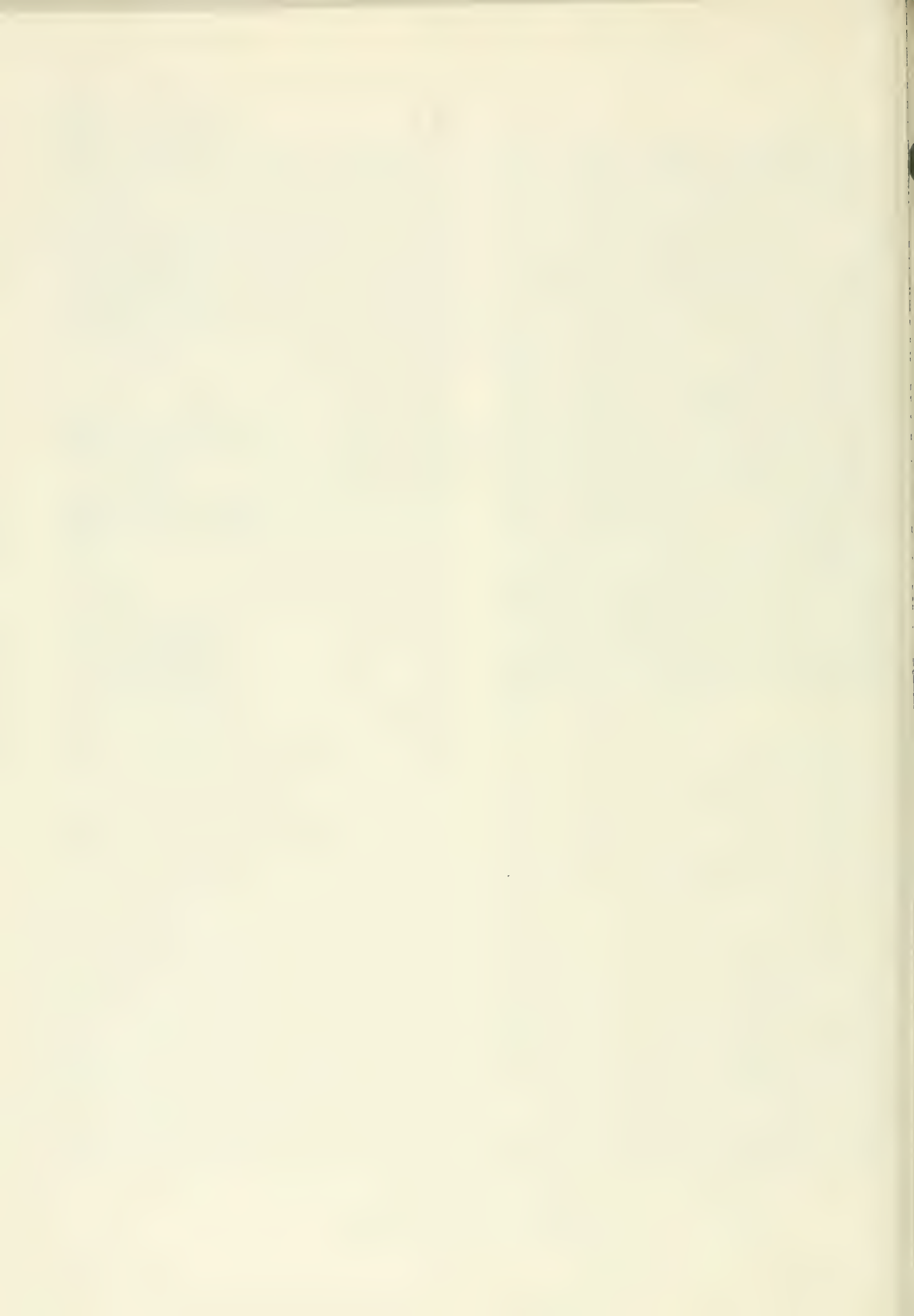
In consideration of the foregoing, a new Motor Vehicle Safety Standard No. 218, Motorcycle Helmets, is added as § 571.218 of Title 49, Code of Federal Regulations, as set forth below.

(Secs. 103, 112, 119, Public Law 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 9, 1973.

James B. Gregory  
Administrator

**38 F.R. 22390**  
**August 20, 1973**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 218

## Motorcycle Helmets

(Docket No. 72-6; Notice 3)

The purpose of this notice is to respond to petitions for reconsideration and petitions for rulemaking to amend Motor Vehicle Safety Standard No. 218, *Motorcycle Helmets* (49 CFR 571.218).

Standard No. 218, published on August 20, 1973, (38 F.R. 22390), established minimum performance requirements for helmets manufactured for use by motorcyclists and other motor vehicle users. Pursuant to 49 CFR 553.35, petitions for reconsideration were filed by the Safety Helmet Council of America (SHCA) and Lear-Siegler, Inc., Bon-Aire Division. Additionally, pursuant to 49 CFR 553.31, petitions to amend the standard were filed by the Z-90 Committee of the American National Standards Institute, Midwest Plastics Corp., Approved Engineering Test Laboratories, Bell-Toptex, Inc., Premier Seat and Accessory Co., Safetech Co., Sterling Products Co., Inc., Lanco Division of Roper Corp., American Safety Equipment Corp., and Electofilm, Inc.

In response to information contained in both the petitions for reconsideration and the petitions for rulemaking, the standard is being amended in some minor respects, and its effectiveness is temporarily suspended for helmets that must be tested on headform sizes A, B, and D. Requested changes in other requirements of the standard are denied.

1. *Effective date.* The NHTSA received comments from Royal Industries/Grant Division, Jefferson Helmets, Inc., and Rebcor, Inc., urging that the March 1, 1974, effective date be reaffirmed and stating that they either have already produced or could produce helmets by that date which meet the standard's requirements. The NHTSA commends these manufacturers for

their outstanding efforts and their positive attitude toward producing safer products.

The parties who submitted petitions, however, all requested some postponement of the standard's effective date. The postponement requests ranged from an indefinite extension to a delay until the manufacturers are able to test helmets to the required headforms, and were sought on the following three grounds: (1) additional time in order to obtain headforms required for reference marking and testing; (2) alleged inadequacy of the headform diagrams provided in the final rule; and (3) inability to find a supplier or forge for the K-1A magnesium alloy required for the impact attenuation test headforms.

As explained in the preamble to the standard, the headforms provided in the Appendix of the notice of proposed rulemaking (May 19, 1972, 37 F.R. 10097), were changed by the agency in order to utilize the readily available Z90.1 headform and to promote greater uniformity in testing and more repeatable results. In view of the fact that the size C headform of the final rule is identical to the Z90.1 headform, is readily available in test laboratories, is used for several ongoing certification programs, and that the other headforms are scaled proportionally, the NHTSA anticipated that competition would motivate both the manufacturers and the test laboratories to take the initiative either to obtain or to produce the other required headforms. It now appears that the problem of finding a supplier or forge for the K-1A magnesium alloy required for the A, B, and D impact attenuation test headforms is substantial enough to justify the requests for a postponement of the standard's effective date for helmets that must be tested on headform sizes A, B, and D.



Because the NHTSA determined that the size C headform would be identical to the Z90.1 headform, the low resonance magnesium alloy (K-1A) specified for making the Z90.1 headform also was specified for headforms required by the standard. Statements that it might be difficult to find suppliers or forges for the material were first made in the petitions on the standard. The NHTSA has determined that other low-resonance magnesium alloys can be substituted for the K-1A type without causing significant variances in the results of any of the helmet tests, so that manufacturers can determine compliance without undue cost penalties even where the K-1A alloy is in short supply. Accordingly, the K-1A alloy is retained as the basic headform material for the standard.

In view of the foregoing considerations with particular emphasis on the fact that testing services through commercial testing laboratories have been readily available for several years for the ANSI Z90.1 Standard headform, which is the size C headform of the standard, the requests for postponing the standard's effective date are denied with respect to helmets that fit headform C.

The petitions for a postponement of the effective date are granted, however, with respect to helmets that must be tested on headforms A, B, and D. A sentence is being added to the Application section of the standard, excepting from its coverage helmets that must be tested on these headform sizes. The second sentence in S6.1.1 of the standard relating to the selection of a reference headform to be used for reference marking should be disregarded until the standard is made effective for helmets that must be tested on headform sizes A, B, and D. To facilitate both the production and availability of headforms, the NHTSA has contracted with the Snell Memorial Foundation to monitor the preparation of detail drawings and model headforms consistent with the requirements of the standard. The drawings and headforms will be included in the docket for public examination upon their completion. A review of the leadtime information provided by the comments to the docket indicates that approximately 8 months of manufacturer leadtime will be needed after the detail dimensional drawings of the A, B, and D head-

forms become available. When the drawings are available, notice to that effect will be published in the Federal Register. The planned effective date for the A, B, and D-size helmets is 8 months from the date of the publication of that notice.

2. *Time duration criteria for impact attenuation test.* Petitions on the impact attenuation test time duration criteria of paragraphs S5.1(b) ranged from eliminating the time duration criteria of 2.0 milliseconds and 4.0 milliseconds at the 200g and 150g levels, respectively, to increasing these criteria to 3.0 milliseconds at the 200g level and 6.0 milliseconds at the 150g level. None of these petitions raised any issues or submitted any data different from those already considered by the NHTSA. The available biomechanical data indicate that the head impact protection provided to the helmet user by the standard's time duration criteria is greater than that which would result from the proposed changes, and the 2.0 and 4.0 millisecond criteria are retained.

3. *Conditioning period.* One petitioner requested that the 24-hour conditioning requirement for each of the four impact tests in paragraph S6.3 be modified to "4 to 24 hours," consistent with the requirements of ANSI Z90.1, arguing that 4 hours is sufficient to condition a helmet to the various environmental conditions required for the respective tests without compromising the intent of the standard. Upon further study of this matter, the NHTSA has concluded that, although 4 hours would not be sufficient as a general condition, changing the conditioning period to 12 hours would facilitate product testing without compromising the intent of the standard. Accordingly, paragraph S6.3, "Conditioning," is revised by changing the "24-hour" conditioning requirement to "12 hours" in each place the 24-hour requirement appears.

4. *Low temperature conditioning requirement.* Three petitioners objected to the  $-20^{\circ}$  F. low temperature conditioning requirement in paragraph S6.3(b) on the basis that the requirement is overly severe. On review of available information, this agency has determined that precise data on the best low temperature requirements for testing are not available. Pending receipt of more specific information, therefore, the cold

temperature requirement of 14° F. that has been used up to now by the American National Standards Institute appears to be the most appropriate. Accordingly, paragraph S6.3(b), "Low temperature," is revised by changing the "-20° F." conditioning requirement to "14° F."

5. *Projections.* One petitioner requested that paragraph S5.5, "Projections," be changed to permit a maximum rigid projection inside the helmet shell of 0.080 in. with a minimum diameter of 0.150 in. The basis for this request is to allow for the use of eyelets and rivets for attachment of snaps for face shields and retention systems. The NHTSA is concerned that due care be exercised with regard to minimizing the injury producing potential of such fasteners. Eyelets and rivets for the attachment of snaps should be designed to form a portion of the continuous surface of the inside of the helmet shell. Where they are so designed, such attachments would not be "rigid projections." Accordingly, no revision to this requirement is necessary.

6. *Labeling.* One petitioner recommended that the labeling requirements in paragraph S5.6 be clarified with the help of manufacturers and other interested parties. Since the petitioner did not specify the points requiring clarification and because no other comments were received on this subject, the NHTSA has determined that no sufficient reasons have been given to change the labeling requirements.

In consideration of the foregoing, 49 CFR 571.218, Motor Vehicle Safety Standard No. 218, *Motorcycle Helmets*, is amended. . . .

*Effective date:* March 1, 1974.

(Secs. 103, 112, 119, Public Law 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 23, 1974.

James B. Gregory  
Administrator  
**39 F.R. 3554**  
**January 28, 1974**





## **PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 218**

### **Motorcycle Helmets**

**(Docket No. 72-6; Notice 06)**

**ACTION:** Final Rule.

**SUMMARY:** The purpose of this notice is to amend Safety Standard No. 218, *Motorcycle Helmets*, to extend application of the current requirements to all helmets that can be placed on the size "C" headform. The amendment is an interim rule requiring the certification of all large-size and many small-size helmets, and will be in effect until test headform sizes "A" and "D" have been developed and incorporated in the standard. This extended application of the standard will establish a minimum level of performance for a large number of helmets that are currently not being tested and certified by manufacturers, but which are suitable for testing on the size "C" headform.

**EFFECTIVE DATE:** May 1, 1980.

**ADDRESSES:** Any petitions for reconsideration should refer to the docket number and notice number and be submitted to: National Highway Traffic Safety Administration, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. William J. J. Liu, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:** For reasons discussed below, on September 27, 1979, the NHTSA published a notice of proposed rulemaking to require, as an interim measure, the testing and certification of all motorcycle helmets that can be placed on the size "C" headform as described in

Safety Standard No. 218 (44 FR 55612). Only one comment was received in response to that notice, supporting the proposal.

Safety Standard No. 218, *Motorcycle Helmets* (49 CFR 571.218), specifies minimum performance requirements for helmets designed for use by motorcyclists and other motor vehicle users. Currently, the standard is only applicable to a portion of the annual helmet production. Paragraph S3 of the standard provides:

\*\*\* The requirements of this standard apply to helmets that fit headform size C, manufactured on or after March 1, 1974. Helmets that do not fit headform size C will not be covered by this standard until it is extended to those sizes by further amendments.

"Fitting" is intended to mean something that is neither too small nor too large. It excludes not only helmets that are too small to be placed on the size "C" headform, but also helmets so large that they could be placed on the size "D" headform were it available. As explained below, that headform size is not currently available.

The standard references and describes in its appendix four test headform sizes ("A", "B", "C", and "D"). Currently only test headform size "C" has been developed, and it is identical to the American National Standard specifications for Protective Headgear for Vehicular Users, ANSI Z90.1-1971. The other test headforms are to be scaled proportionately from the ANSI Z90 (size "C") headform. The performance requirements of the standard for helmets fitting other than size C headforms were held in abeyance until these additional headform sizes could be developed (39 FR 3554, January 28, 1974). Because of problems with prototype headforms supplied to NHTSA under contract (the headforms did not meet

dimensional tolerances considered acceptable), development of these additional headforms has been delayed over the past years. However, the agency now anticipates that the standard will include requirements for headform sizes "A" and "D" effective April 1, 1982 (size "B" will be deleted from the standard).

Last year, the Safety Helmet Council of America (SHCA) recommended that the agency require certification of all adult-size helmets on the size "C" headform. The SHCA stated that the delay in development of the additional headform sizes has led to confusion and unfair practices since many helmets are reportedly being improperly certified and many other helmets are not being certified that are required to comply with the standard. The agency has stated in the past that only helmets that are subject to compliance with Standard No. 218 should be certified and labeled with the "DOT" symbol. Apparently, some manufacturers have used the "DOT" label on untested helmets for competitive purposes. The SHCA stated that these practices have placed considerable burdens on the integrity of manufacturers of high quality helmets. The organization pointed out that under the ANSI standard only one headform (size "C") was used to test all helmets except child-size helmets, and that approximately 95 percent of current helmet production could and should be tested on the size "C" headform and certified for compliance with Standard No. 218.

The NHTSA Office of Vehicle Safety Standards has investigated the current labeling and certification practices of helmet manufacturers. It was found that most manufacturers currently test only "medium" size helmets on the size "C" headform, yet there is considerable variation among manufacturers as to which helmets are considered medium. Further, the agency found that the percentage of helmets subject to certification under the current applicability of the standard is substantially greater than the 40 percent that manufacturers are now testing on the size "C" headform. (Data from the investigation have been placed in the NHTSA docket under the docket number of this notice.)

As stated earlier, under the existing applicability requirements of the standard, only helmets that "fit" headform size "C" must be certified. Apparently, interpretation of the term "fit" by

manufacturers has led to some mislabelings and failures to certify. Under the existing requirements, "helmets that fit headform size C" should be all helmets other than those that must be tested on the other headform sizes. To determine which helmets must be tested on a particular headform size, one follows the procedures of paragraph S6.1.1 of the standard. That paragraph provides in part:

\* \* \* Place the complete helmet to be tested on the reference headform of the largest size specified in the Appendix whose circumference is not greater than the internal circumference of the headband when adjusted to its largest setting, or if no headband is provided to the corresponding interior surface of the helmet.

Using the procedure of paragraph S6.1.1, manufacturers currently need only concern themselves with headform sizes "C" and "D", since small, child-size helmets that could not physically be placed on the size "C" headform would not have to be tested. As to the other helmet sizes, helmets that "fit headform size C" means any helmet that can be placed on the size "C" headform, except those helmets which the manufacturer can demonstrate could be placed on a size "D" headform. To make that demonstration, the manufacturers would have to show that the internal circumference of the helmet headband or the corresponding interior surface of the helmet is larger than the circumference of the size "D" headform. Even though the size "D" headform is not currently available, the dimensions of the headform are specified in the appendix of the standard, from which the manufacturer can make its determination. Regarding small, child-size helmets, the determination whether or not a particular helmet can be placed on the size "C" headform should be based on normal fitting procedures. This means, for example, that undue force should not be applied to forcibly push the headform into the helmet. However, efforts necessary for the ordinary wearing of the helmet should be employed, such as expanding the lower portions of a flexible-shell, full-face helmet. Apparently, many manufacturers have failed to use these procedures for determining which of their helmets "fit" headform size "C" and must be certified.

In light of the improper certification and the noncertification, the unavailability of the additional headform sizes at the present time, the



need to ensure the safe performance of the large helmets and the apparent sufficiency of the size "C" headform for testing large helmets, the agency has concluded that the recommendations of the Safety Helmet Council of America have merit. Therefore, this notice amends Safety Standard No. 218 to require all motorcycle helmets that can be placed on the size "C" headform to be certified in accordance with the requirements of the standard. "Placed" is a broader term than "fit" primarily in that the former term does not imply any upper limit on helmet size.

Under these interim requirements, more than 90 percent of current helmet production will be tested on the size "C" headform. Only small, child-size helmets (size "A") will be excluded since they cannot physically be placed on the size "C" headform. As noted in the procedures discussed above, normal fitting procedures are used to determine if a particular helmet can be placed on the size "C" headform, without the use of undue force.

During its investigation, the NHTSA contacted manufacturers whose collective market share exceeds 80 percent of current annual helmet production. All of these manufacturers indicated that 90 percent or more of their helmet production could be placed and tested on the size "C" headform. Many of the manufacturers indicated that they are already testing the majority of their helmets on the size "C" headform for quality-control purposes, even though not required by the standard. Also, it was found that helmet shells and performance characteristics of a particular manufacturer's helmets do not generally vary significantly over the various size ranges of helmets produced.

This amendment is only an interim measure to establish a minimum level of performance for the large number of helmets that are currently not being certified for compliance with Standard No. 218. Testing extra-large helmets on the size "D" headform would require a higher level of performance for those helmets, since the weight of the size "D" headform is greater than that of the size "C" headform. Therefore, development of the size "A" and size "D" headforms has continued, and incorporation of requirements in the standard for these headforms will occur after development is completed. However, until this is accomplished,

the agency believes that the performance level that will be required by testing on the size "C" headform is preferable to an absence of any requirements whatsoever. As stated earlier, the ANSI standard for helmets specifies only one headform size ("C") for testing all helmets. The additional headform sizes were originally specified in Standard No. 218 in response to suggestions from some manufacturers that requirements be more "fine-tuned" for the various helmet sizes.

The agency has concluded that the new requirements will preclude the great majority of unsafe helmets currently on the road. Further, with all adult helmets certified, retailers and consumers will no longer be confused or misled concerning the DOT certification labels found in their helmets, and NHTSA's enforcement activities will become more effective and uniform.

Under these new requirements, extra-large helmets should be tested on the size "C" headform without the use of "shims" or other devices to obtain a secure fit of the helmet on the headform. Agency tests involving extra-large helmets on the size "C" headform show results that correlate well with tests of medium-size helmets on the size "C" headform. (Data from these tests have been placed in the NHTSA docket). Therefore, the agency has concluded that repeatable results can be obtained under the existing procedures with the size "C" headform.

The effective date for extending the applicability of Standard No. 218 to all helmets that can be placed on the size "C" headform is May 1, 1980. The agency's past position has been that it would be "false and misleading," within the meaning of the statute (15 U.S.C. 1397(C)), for a "DOT" symbol to appear without qualification on helmets manufactured before the effective date of the standard. However, since the standard is currently effective for helmets that fit size "C" headforms, and since there is such a widespread variation among manufacturers as to which helmets they consider to fit the size "C" headform, the agency will allow voluntary certification and labeling of helmets prior to May 1, 1980. This, of course, would only apply to helmets that can be placed on the size "C" headform. Small helmets that could not be placed on the headform could not be certified with the "DOT" symbol until after the



standard has been amended to include specifications for the size "A" headform. Also, helmets certified and labeled with the "DOT" symbol prior to the May 1, 1980, effective date will be subject to the general enforcement provisions of the National Traffic and Motor Vehicle Safety Act. Therefore, manufacturers will have to exercise "due care" to assure that any helmet they certify in fact complies with the performance requirements of Standard No. 218.

The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12044, "Improving Government Regulations." A final regulatory evaluation of this amendment has been placed in the docket for the benefit of all interested persons.

The engineer and lawyer primarily responsible for the development of this notice are William J. J. Liu and Hugh Oates, respectively.

In consideration of the above, paragraph S3 of Safety Standard No. 218, *Motorcycle Helmets* (49 CFR 571.218), is amended to read as follows:

§ 571.218 *Standard No. 218; motorcycle helmets.*

\* \* \* \* \*

S3. *Application.* This standard applies to helmets designed for use by motorcyclists and other motor vehicle users. The requirements of this standard apply to all helmets that can be placed on the size C headform using normal fitting procedures. Helmets that cannot be placed on the size C headform will not be covered by this standard until it is extended to those sizes by further amendment.

\* \* \* \* \*

(The second sentence in S6.1.1 of the standard relating to the selection of a reference headform should be disregarded until the standard is made effective for helmets that must be tested on headform sizes A and D.)

Issued on February 29, 1980.

Joan Claybrook  
Administrator

**45 F.R. 15179**  
**March 10, 1980**

## MOTOR VEHICLE SAFETY STANDARD NUMBER 218

### Motorcycle Helmets

(Docket No. 72-6; Notice 2)

**S1. Scope.** This standard establishes minimum performance requirements for helmets designed for use by motorcyclists and other motor vehicle users.

**S2. Purpose.** The purpose of this standard is to reduce deaths and injuries to motorcyclists and other motor vehicle users resulting from head impacts.

**S3. Application.** This standard applies to helmets designed for use by motorcyclists and other motor vehicle users. The requirements of this standard apply to all helmets that can be placed on the size C headform using normal fitting procedures. Helmets that cannot be placed on the size

C headform will not be covered by this standard until it is extended to those sizes by further amendment.

#### S4. Definitions.

“Basic plane” means a plane through the centers of the right and left external ear openings and the lower edge of the eye sockets (Figure 1) of a reference headform (Figure 2) or test headform.

“Midsagittal plane” means a longitudinal plane through the apex of a reference headform or test headform that is perpendicular to the basic plane (Figure 3).

“Reference plane” means a plane above and parallel to the basic plane on a reference head-

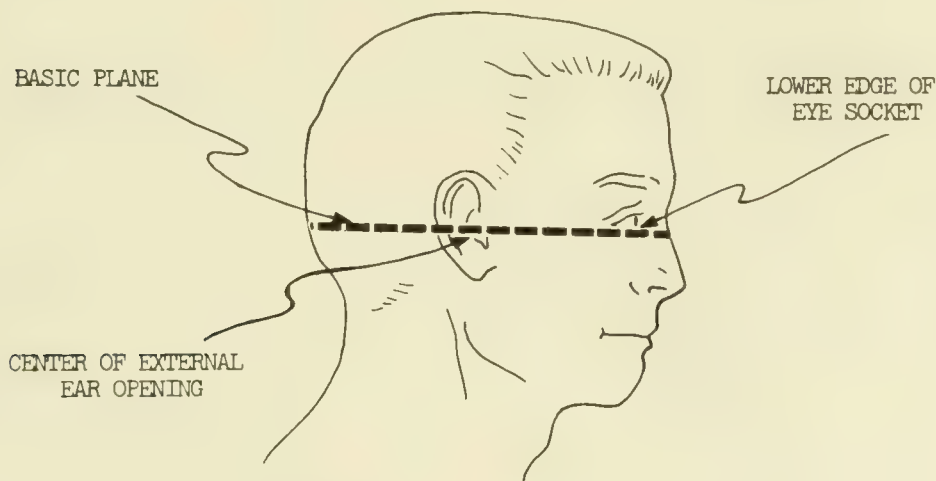


Figure 1

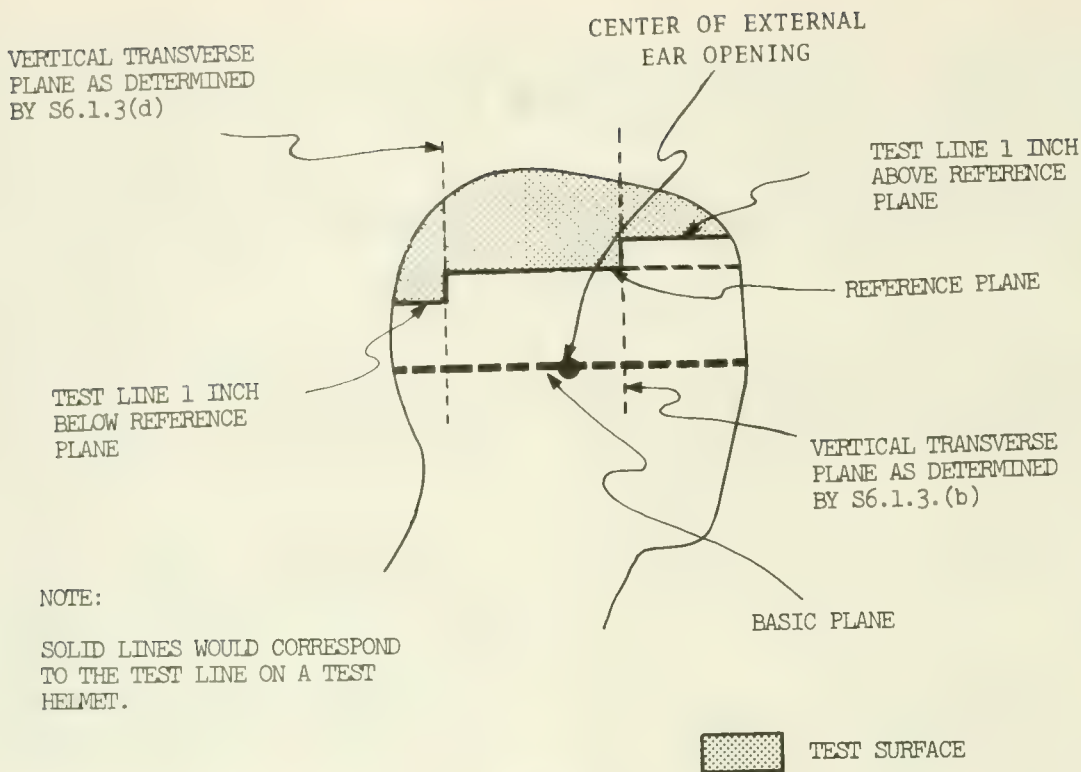


Figure 2

form or test headform (Figure 2) at the distance indicated in the Appendix.

“Reference headform” means a measuring device contoured to the dimensions of one of the four headforms described in the Appendix, with surface markings indicating the locations of the basic, midsagittal, and reference planes, and the centers of the external ear openings.

“Test headform” means a test device contoured to the dimensions of one of the four reference headforms described in the Appendix for all surface areas that contact the helmet, with surface markings indicating the locations of the basic, midsagittal, and reference planes.

“Retention system” means the complete assembly by which the helmet is retained in position on the head during use.

“Helmet positioning index” means the distance in inches, as specified by the manufacturer, from the lowest point of the brow opening at the lateral midpoint of the helmet to the basic plane of a reference headform, when the helmet is

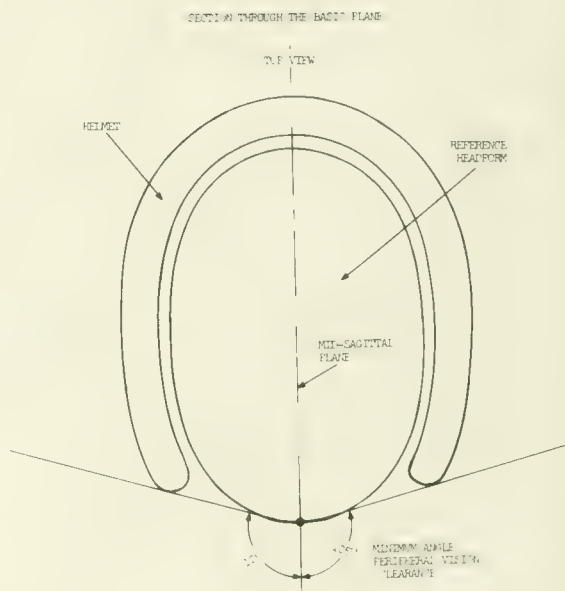


Figure 3



firmly and properly positioned on the reference headform.

**S5. Requirements.** Each helmet shall meet the requirements of S5.1 through S5.3 when subjected to any conditioning procedure specified in S6.3, and tested in accordance with S7.

**S5.1 Impact attenuation.** When an impact attenuation test is conducted in accordance with S7.1, all of the following requirements shall be met:

- (a) Peak accelerations shall not exceed 400g;
- (b) Accelerations in excess of 200g shall not exceed a cumulative duration of 2.0 milliseconds; and
- (c) Accelerations in excess of 150g shall not exceed a cumulative duration of 4.0 milliseconds.

**S5.2 Penetration.** When a penetration test is conducted in accordance with S7.2, the striker shall not contact the surface of the test headform.

**S5.3 Retention system.**

**S5.3.1** When tested in accordance with S7.3:

- (a) The retention system or its components shall attain the loads specified without separation; and
- (b) The adjustable portion of the retention system test device shall not move more than 1 inch measured between preliminary and test load positions.

**S5.3.2** Where the retention system consists of components which can be independently fastened without securing the complete assembly, each such component shall independently meet the requirements of S5.3.1.

**S5.4 Configuration.** Each helmet shall have a protective surface of continuous contour at all points in or above the test line described in S6.1.3. The helmet shall provide peripheral vision clearance of at least 105° to each side of the midsagittal plane, when the helmet is adjusted as specified in S6.2. The vertex of these angles, shown in Figure 3, shall be at the point on the anterior surface of the reference headform at the intersection of the midsagittal and basic planes. The brow opening of the helmet shall be at least 1 inch above all points in the basic plane that are within the angles of peripheral vision (see Figure 3).

**S5.5 Projections.** A helmet shall not have any rigid projections inside its shell. Rigid projections outside any helmet's shell shall be limited to those required for operation of essential accessories, and shall not protrude more than 0.19 inch.

**S5.6 Labeling.**

**S5.6.1** Each helmet shall be permanently and legibly labeled, in a manner such that the label(s) can be easily read without removing padding or any other permanent part, with the following:

- (1) Manufacturer's name or identification.
- (2) Precise model designation.
- (3) Size.
- (4) Month and year of manufacture. This may be spelled out (e.g., June 1974), or expressed in numerals (e.g., 6/74).
- (5) The symbol DOT, constituting the manufacturer's certification that the helmet conforms to the applicable Federal Motor Vehicle Safety Standards. This symbol shall appear on the outer surface, in a color that contrasts with the background, in letters at least  $\frac{3}{8}$  inch high, centered laterally approximately  $1\frac{1}{4}$  inches from the bottom edge of the posterior portion of the helmet.
- (6) Instruction to the purchaser as follows:
  - "Shell and liner constructed of (identify type(s) of materials).
  - "Helmet can be seriously damaged by some common substances without damage being visible to the user. Apply only the following: (Recommended cleaning agent, paints, adhesives, etc., as appropriate).
  - "Make no modifications. Fasten helmet securely. If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy and replace it." (On an attached tag, brochure, or other suitable means, any additional, relevant safety information should be supplied at the time of purchase).

**S5.7 Helmet positioning index.** Each manufacturer of helmets shall establish a positioning index for each helmet he manufactures. This index shall be furnished immediately to any person who requests the information, with respect to a helmet identified by manufacturer, model designation, and size.

**S6. Preliminary test procedures.** Before subjecting a helmet to the testing sequence specified in S7., prepare it according to the following procedures.

#### **S6.1 Reference marking.**

**S6.1.1** Use a reference headform that is firmly seated with the basic and reference planes horizontal. Place the complete helmet to be tested on the reference headform of the largest size specified in the Appendix whose circumference is not greater than the internal circumference of the headband when adjusted to its largest setting, or if no headband is provided to the corresponding interior surface of the helmet.

**S6.1.2** Apply a 10-pound static load normal to the helmet's apex. Center the helmet laterally and seat it firmly on the reference headform according to its helmet positioning index.

**S6.1.3** Maintaining the load and position described in S6.1.2, draw a line (hereinafter referred to as "test line") on the outer surface of the helmet coinciding with portions of the intersection of that surface with the following planes, as shown in Figure 2:

(a) A plane 1 inch above and parallel to the reference plane in the anterior portion of the reference headform;

(b) A vertical transverse plane 2.5 inches behind the point on the anterior surface of the reference headform at the intersection of the midsagittal and reference planes;

(c) The reference plane of the reference headform;

(d) A vertical transverse plane 2.5 inches behind the center of the external ear opening in a side view; and

(e) A plane 1 inch below and parallel to the reference plane in the posterior portion of the reference headform.

**S6.2 Helmet positioning.** Prior to each test, fix the helmet on a test headform in the position that conforms to its helmet positioning index. Secure the helmet so that it does not shift position prior to impact or the application of force during testing.

**S6.2.1** In testing as specified in S7.1 and S7.2, place the retention system in a position such that

it does not interfere with free fall, impact, or penetration.

**S6.3 Conditioning.** Immediately prior to conducting the testing sequence specified in S7., condition each test helmet in accordance with any one of the following procedures:

(a) *Ambient conditions.* Expose to a temperature of 70° F. and a relative humidity of 50% for 12 hours.

(b) *Low temperature.* Expose to a temperature of 14° F. for 12 hours.

(c) *High temperature.* Expose to a temperature of 122° F. for 12 hours.

(d) *Water immersion.* Immerse in water at a temperature of 77° F. for 12 hours.

If during testing, the time out of the conditioning environment for a test helmet exceeds 5 minutes, return the helmet to the conditioning environment for a minimum of 3 minutes for each minute out of the conditioning environment or 12 hours, whichever is less, prior to resumption of testing.

#### **S7. Test conditions.**

##### **S7.1 Impact attenuation test.**

**S7.1.1** Impact attenuation is measured by determining acceleration imparted to an instrumented test headform on which a complete helmet is mounted as specified in S6.2, when it is dropped in guided free fall upon fixed hemispherical and flat steel anvils.

**S7.1.2** Each helmet is impacted at four sites with two successive, identical impacts at each site. Two of these sites are impacted upon a flat steel anvil and two upon a hemispherical steel anvil as specified in S7.1.7 and S7.1.8. The impact sites are at any point on the area above the test line described in S6.1.3, and separated by a distance not less than one-sixth of the maximum circumference of the helmet.

**S7.1.3** The guided free fall drop heights for the helmet and test headform combination onto the hemispherical anvil and flat anvil are 54.5 inches and 72 inches, respectively.

**S7.1.4** Test headforms for impact attenuation testing are constructed of magnesium alloy (K-1A), and exhibit no resonant frequencies below 3,000 Hz.



**S7.1.5** Weight of the drop assembly, as specified in Table I, is the combined weight of the instrumented test headform and supporting assembly for the drop test. The weight of the supporting assembly does not exceed 20% of the weight of the drop assembly. The center of gravity of the combined test headform and supporting assembly lies within a cone with its axis vertical and forming a 10° included angle with the vertex at the point of impact.

TABLE I  
WEIGHTS FOR  
IMPACT ATTENUATION TEST  
DROP ASSEMBLY

Reference Headform Size	Weight (Lbs)*
A	7.8
B	8.9
C	11.0
D	13.4

\*Combined weight of instrumented test headform and supporting assembly for drop test.

**S7.1.6** The acceleration transducer is mounted at the center of gravity of the combined test headform and supporting assembly with the sensitive axis aligned to within 5% of vertical when the test headform is in the impact position. The acceleration data channel complies with SAE Recommended Practice J211 requirements for channel class 1,000.

**S7.1.7** The flat anvil is constructed of steel with a 5-inch minimum diameter impact face, and the hemispherical anvil is constructed of steel with a 1.9-inch radius impact face.

**S7.1.8** The rigid mount for both of the anvils consists of a solid mass of at least 300 pounds, the outer surface of which consists of a steel plate with minimum thickness of 1 inch and minimum surface area of 1 ft.<sup>2</sup>

## **S7.2 Penetration test.**

**S7.2.1.** The penetration test is conducted by dropping the penetration test striker in guided free fall, with its axis aligned vertically, onto the outer surface of the complete helmet, when mounted as specified in S6.2, at any point above

the test line, described in S6.1.3, except on a fastener or other rigid projection.

**S7.2.2** Two penetration blows are applied at least 3 inches apart, and at least 3 inches from the centers of any impacts applied during the impact attenuation test.

**S7.2.3** The height of the guided free fall is 118.1 inches, as measured from the striker point to the impact point on the outer surface of the test helmet.

**S7.2.4** The contactable surfaces of the penetration test headforms are constructed of a metal or metallic alloy having a Brinell hardness number no greater than 55, which will readily permit detection should contact by the striker occur. The surface is refinished if necessary prior to each penetration test blow to permit detection of contact by the striker.

**S7.2.5** The weight of the penetration striker is 6 pounds, 10 ounces.

**S7.2.6** The point of the striker has an included angle of 60°, a cone height of 1.5 inches, a tip radius of 0.019 inch (standard 0.5 millimeter radius) and a minimum hardness of 60 Rockwell, C-scale.

**S7.2.7** The rigid mount for the penetration test headform is as described in S7.1.8.

## **S7.3 Retention system test.**

**S7.3.1** The retention system test is conducted by applying a static tensile load to the retention assembly of a complete helmet, which is mounted, as described in S6.2, on a stationary test headform as shown in Figure 4, and by measuring the movement of the adjustable portion of the retention system test device under tension.

**S7.3.2** The retention system test device consists of both an adjustable loading mechanism by which a static tensile load is applied to the helmet retention assembly and a means for holding the test headform and helmet stationary. The retention assembly is fastened around two freely moving rollers, both of which have 0.5 inch diameter and a 3-inch center-to-center separation, and which are mounted on the adjustable



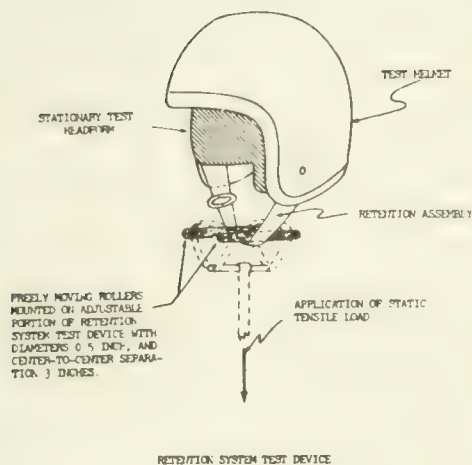


Figure 4

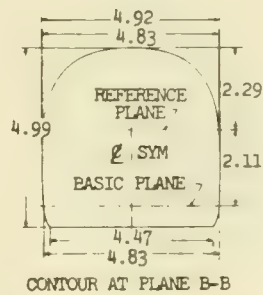
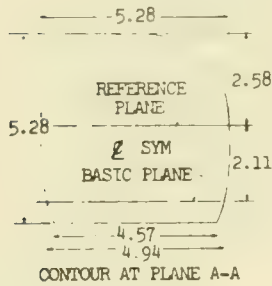
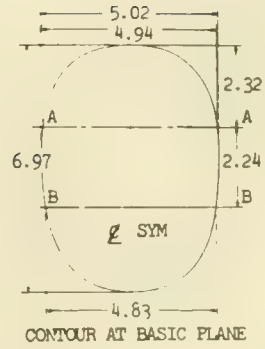
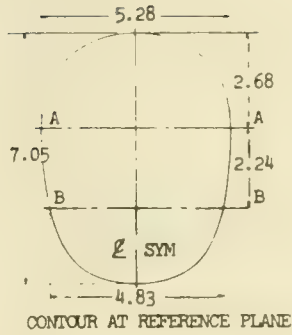
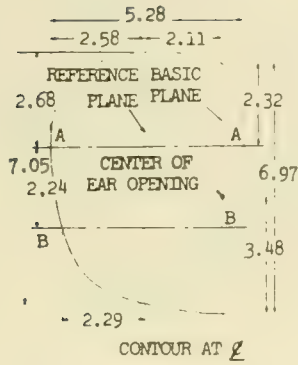
portion of the tensile loading device (Figure 4). The helmet is fixed on the test headform as necessary to ensure that it does not move during the application of the test loads to the retention assembly.

**S7.3.3** A 50-pound preliminary test load is applied to the retention assembly, normal to the basic plane of the test headform and symmetrical with respect to the center of the retention assembly for 30 seconds, and the maximum distance from the extremity of the adjustable portion of the retention system test device to the apex of the helmet is measured.

**S7.3.4** An additional 250-pound test load is applied to the retention assembly, in the same manner and at the same location as described in S7.3.3, for 120 seconds, and the maximum distance from the extremity of the adjustable portion of the retention system test device to the apex of the helmet is measured.

# APPENDIX

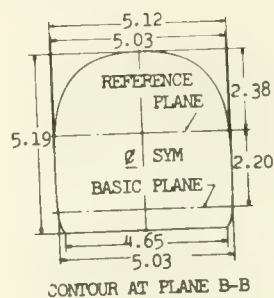
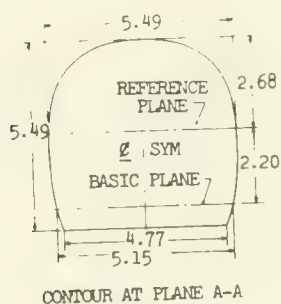
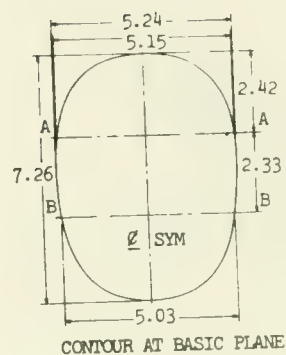
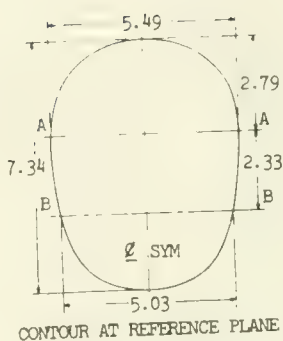
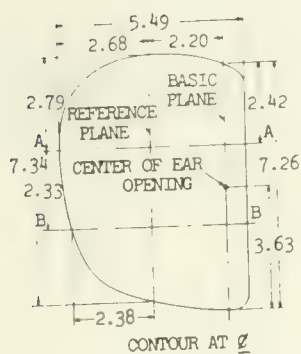
i



HEADFORM A

ALL DIMENSIONS IN INCHES

ii

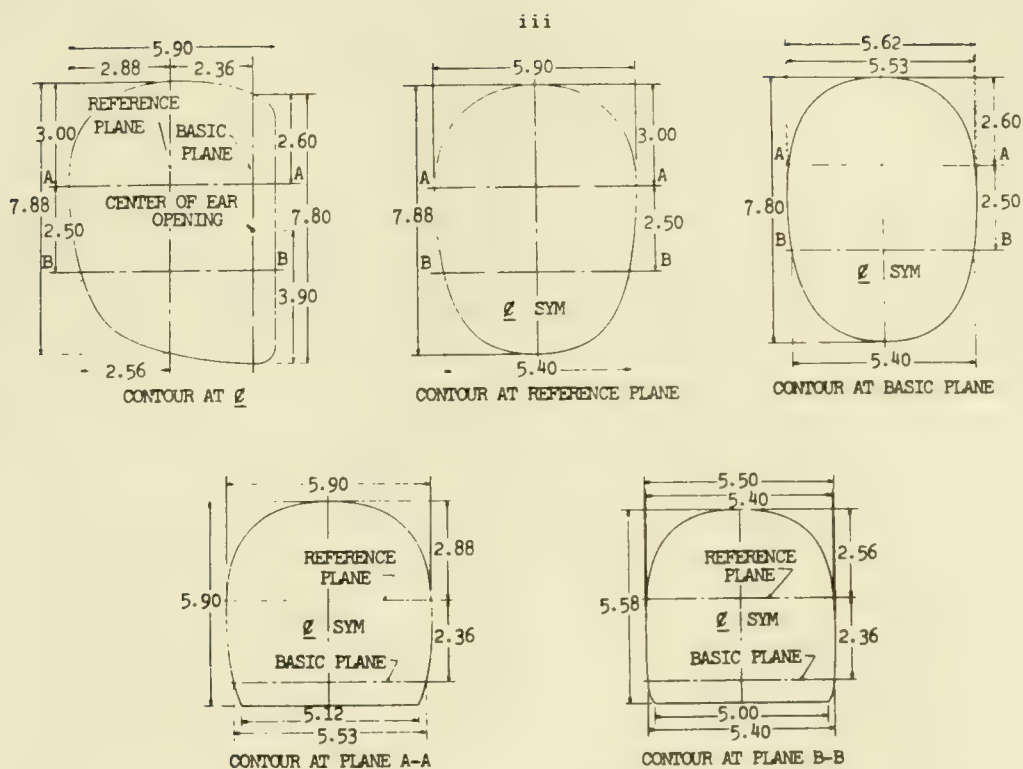


HEADFORM B

ALL DIMENSIONS IN INCHES

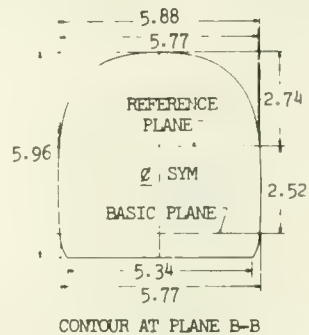
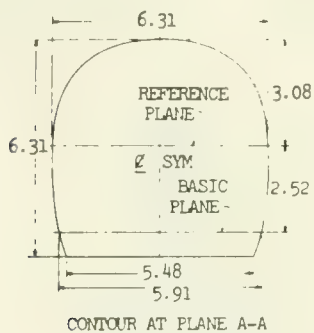
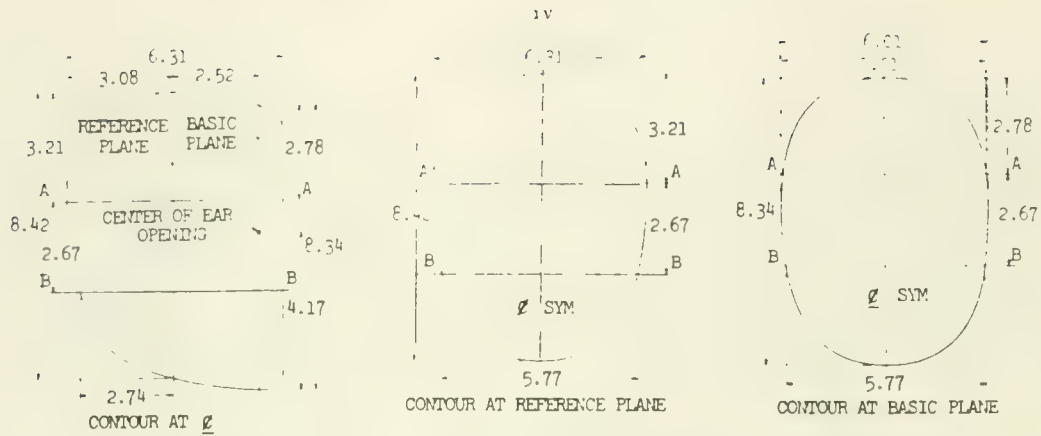
PART 571; S 218-8





HEADFORM C

ALL DIMENSIONS IN INCHES



HEADFORM D

ALL DIMENSIONS IN INCHES

38 F.R. 22390  
August 20, 1973

**PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 219****Windshield Zone Intrusion****(Docket No. 74-21; Notice 2)**

This notice establishes a new Motor Vehicle Safety Standard No. 219, 49 CFR 571.219, that regulates the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test.

The notice of proposed rulemaking on which this issuance is based was issued on May 20, 1974 (39 F.R. 17768). An earlier notice had been issued on August 31, 1972 (37 F.R. 17763), proposing a standard that would prohibit penetration of the protected zone by any part of a vehicle outside of the occupant compartment during a 30-mph frontal impact into a fixed barrier. After further study and an analysis of comments submitted in response to that notice, the NHTSA determined that the initial rule was unnecessarily stringent since its near-total ban on intrusion had the effect of prohibiting entrance into the protected zone or contact with the windshield by small particles such as paint chips and glass which do not represent a danger to the vehicle occupants if they enter the zone and impact the windshield opening with a limited amount of force.

Consequently, in the notice published on May 20, 1974, the proposed standard on windshield zone intrusion was amended to permit penetration by particles, to a depth of no more than one-quarter inch into a styrofoam template in the shape of the protected zone and affixed to the windshield, during a 30-mph frontal barrier crash.

In addition, the amended proposal published May 20, 1974, provided that contact by vehicle parts with the windshield opening in the area below the protected zone, during a 30-mph barrier crash test, would not be prohibited provided

that the inner surface of that portion of the windshield is not penetrated. The procedure for determining the lower edge of the protected zone was also revised.

Standard No. 219, *Windshield Zone Intrusion*, reflects some minor changes incorporated for clarification following publication of the proposed rule on May 20, 1974. First, open-body-type vehicles with fold-down or removable windshields have been added to forward control vehicles as vehicle types to which the standard does not apply. A structurally unsupported windshield, essential to the utility of this vehicle type, typically does not remain in place during a 30-mph frontal barrier crash test, hence the test is impracticable for this type of vehicle.

In addition, the standard provides that its prohibitions against penetration by particles to a depth of more than one-quarter inch into the styrofoam template and penetration of the inner surface of the portion of the windshield below the protected zone do not apply to windshield molding and other components designed to be normally in contact with the windshield. This provision was contained in the proposed standard published August 31, 1972 but omitted from the proposal published May 20, 1974.

The standard as adopted also specifies that the 6.5-inch-diameter rigid sphere employed to determine the lower edge of the protected zone shall weigh 15 pounds, the approximate weight of the head and neck of an average driver or passenger.

Comments submitted by Wayne Corporation and Sheller-Globe Corporation, manufacturers of funeral coaches and ambulances, urged that the standard for windshield zone intrusion contain an exception for such vehicles in view of



the low incidence of accidents involving funeral coaches and ambulances, the low volume of production of such vehicles, and the high cost of barrier crash testing. The NHTSA has determined that these arguments are without merit. The manufacturers have presented no evidence to support the contention that funeral coaches and ambulances are involved in fewer accidents in proportion to their numbers than other vehicles. Furthermore, several comments criticizing the allegedly prohibitive costs of compliance with the standard appear to have erroneously assumed that every manufacturer must conduct barrier crash tests. The performance requirement for windshield zone intrusion is set out in S5. of the standard. A manufacturer of funeral coaches and ambulances may, for example, assure itself that the requirement is met by barrier crashing the conventional chassis which is a component of the special vehicle, modified to simulate the dynamic characteristics of the funeral coach or ambulance. Or, the manufacturer may use the design characteristic of the vehicle taking into account the modifications it makes, or information supplied by the chassis manufacturer.

Low volume of production is not an appropriate basis for an exemption. As the NHTSA has maintained in past proceedings where the same argument was advanced, the appropriate means to avoid application of a standard on

hardship grounds is a temporary exemption under 49 CFR Part 555.

Finally, the NHTSA is continuing to promote compatibility and economy in barrier crash testing by adopting vehicle loading and dummy restraint requirements in Standard No. 219 identical to those set out in proposed amendments to Standard No. 301, *Fuel System Integrity*, 49 CFR 571.301 (40 F.R. 17036, April 16, 1975). It has therefore required that 50th-percentile test dummies be placed in the seating positions whose restraint system is required to be tested by a dummy under Standard No. 208, *Occupant Crash Protection*, 49 CFR 571.208, and that they may be restrained only by the means that are installed in the vehicle at the respective seating positions.

In consideration of the foregoing, 49 CFR Part 571 is amended by the addition of a new Standard No. 219, 49 CFR 571.219, *Windshield Zone Intrusion*. . . .

*Effective date:* September 1, 1976.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51.)

Issued on June 9, 1975.

James B. Gregory  
Administrator

**40 F.R. 25462**  
**June 16, 1975**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 219

### Windshield Zone Intrusion

(Docket No. 74-21; Notice 3)

This notice responds to four petitions for reconsideration of the notice published June 16, 1975 (40 FR 25462), which established a new Motor Vehicle Safety Standard No. 219, *Windshield Zone Intrusion*, 49 CFR 571.219, regulating the intrusion of vehicle parts from outside the occupant compartment into a defined zone in front of the windshield during a frontal barrier crash test. The National Highway Traffic Safety Administration (NHTSA) hereby amends Standard No. 219 on the basis of the information and arguments presented by some of the petitioners.

Petitions for reconsideration were received from the Motor Vehicle Manufacturers Association (MVMA), General Motors, Ford, and Jeep. MVMA, General Motors, and Ford requested substitution of the term "daylight opening" for "windshield opening," and General Motors and Jeep requested a change in the effective date of Standard No. 219 from September 1, 1976 to September 1, 1977. In addition, Jeep requested that Standard No. 219 not become applicable until final issuance of Standard No. 212, *Windshield Mounting*, 49 CFR 571.212.

The NHTSA has determined that the petitions of MVMA, General Motors, and Ford requesting substitution of the term "daylight opening" for "windshield opening" have merit, and they are therefore granted. These petitioners requested that the term "windshield opening" be replaced by the term "daylight opening", which is defined in paragraph 2.3.12 of section E, Ground Vehicle Practice, SAE Aerospace-Automotive Drawing Standards, September, 1963. The part of the windshield below the daylight opening is protected by the cowl and instrument panel. There is little likelihood that

in a frontal crash any vehicle component will penetrate the cowl and instrument panel with sufficient force to pose a threat to the vehicle occupants. Therefore, the zone intrusion requirements of Standard No. 219 should only apply to the area of the windshield susceptible to actual penetration by vehicle components in a crash. Accordingly, the term "windshield opening" as it is used in Standard No. 219, is replaced by "daylight opening." The SAE definition of "daylight opening" has been slightly modified to reflect the particular characteristics of Standard No. 219.

The NHTSA has concluded that the petitions of General Motors and Jeep requesting a change in the effective date of Standard No. 219 should be granted in part and denied in part. The economic considerations involved in coordinating the effective date of Standard No. 219 with that of Standard No. 212, *Windshield Mounting*, justify postponement of the effective date to September 1, 1977, for application of Standard No. 219 to all vehicles except passenger cars. However, the effective date of September 1, 1976, will be retained for passenger cars because of their greater susceptibility to the intrusion of vehicle parts against which this standard is designed to protect. This postponement of effective dates also grants in part Jeep's petition requesting that the applicability of Standard No. 219 be postponed until final issuance of Standard No. 212.

In consideration of the foregoing, § 571.219 is amended by revising S4., S5., and S6.1(d) of Standard No. 219, *Windshield Zone Intrusion*, to read as follows:

*Effective date:* September 1, 1976, for passenger cars; September 1, 1977, for multipurpose

Effective: September 1, 1976  
September 1, 1977

passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

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Issued on November 10, 1975.

James B. Gregory  
Administrator

**40 F.R. 53033**  
**November 14, 1975**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 219

### Windshield Zone Intrusion

(Docket No. 74-21; Notice 5)

This notice amends Standard No. 219, *Windshield Zone Intrusion*, to exclude walk-in van-type vehicles from the requirements of the standard.

The National Highway Traffic Safety Administration (NHTSA) proposed to exclude walk-in van-type vehicles from the applicability of Standard No. 219 (49 CFR 571.219) in a notice published March 11, 1976 (41 FR 10451). No opposition was registered in response to the proposed rulemaking. The National Motor Vehicle Safety Advisory Council did not take a position on the proposal.

The NHTSA, therefore, amends Standard No. 219 in accordance with the proposal. For the information of all interested persons, the NHTSA considers a "walk-in van-type" vehicle to be only the "step van" city delivery type of vehicle that permits a person to enter the vehicle without stooping.

It has been determined that this amendment will have a negligible economic and environ-

mental impact, since it creates an exemption from existing requirements that is expected to affect relatively few vehicles.

In consideration of the foregoing, paragraph S3 of Standard No. 219 (49 CFR 571.219) is amended . . . .

*Effective date:* December 16, 1976. Because this amendment relieves a restriction and does not create additional obligations for any person and because it permits the resumption of manufacture of a vehicle type not intended to be covered by the standard, it is found that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on December 10, 1976.

Charles E. Duke  
Acting Administrator

**41 FR 54945**  
**December 16, 1976**



## MOTOR VEHICLE SAFETY STANDARD NO. 219

### Windshield Zone Intrusion

**S1. Scope.** This standard specifies limits for the displacement into the windshield area of motor vehicle components during a crash.

**S2. Purpose.** The purpose of this standard is to reduce crash injuries and fatalities that result from occupants contacting vehicle components displaced near or through the windshield.

**S3. Application.** This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses of 10,000 pounds or less gross vehicle weight rating. However, it does not apply to forward control vehicles, walk-in van-type vehicles, or to open body-type vehicles with fold-down or removable windshields.

#### S4. Definitions.

“Daylight Opening” (DLO) means the maximum unobstructed opening through the glazing surface, including reveal or garnish moldings adjoining the surface, as measured parallel to the outer surface of the glazing material.

“Windshield opening” means the outer surface of the windshield glazing material.

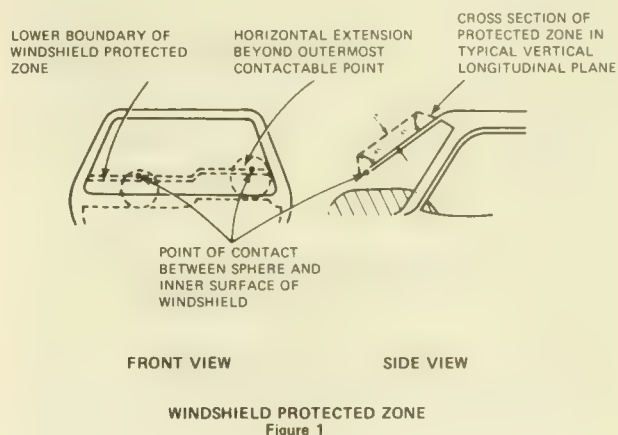
**S5. Requirement.** When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, under the conditions of S7, no part of the vehicle outside the occupant compartment, except windshield molding and other components designed to be normally in contact with the windshield, shall penetrate the protected zone template, affixed according to S6, to a depth of more than one-quarter inch, and no such part of a vehicle shall penetrate the inner surface of

that portion of the windshield, within the DLO, below the protected zone defined in S6.

#### S6. Protected zone template.

**S6.1** The lower edge of the protected zone is determined by the following procedure (see Figure 1).

(a) Place a 6.5-inch diameter rigid sphere, weighing 15 pounds, in a position such that it simultaneously contacts the inner surface of the



windshield glazing and the surface of the instrument panel, including padding. If any accessories or equipment such as the steering control system obstruct positioning of the sphere, remove them for the purposes of this procedure.

(b) Draw the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contactable points, extend



the locus line horizontally to the edges of the glazing material.

(c) Draw a line on the inner surface of the windshield below and one-half inch distant from the locus line.

(d) The lower edge of the protected zone is the longitudinal projection onto the outer surface of the windshield of the line determined in S6.1(c).

**S6.2** The protected zone is the space enclosed by the following surfaces, as shown in Figure 1:

(a) The outer surface of the windshield in its precrash configuration.

(b) The locus of points 3 inches outward along perpendiculars drawn to each point on the outer surface of the windshield.

(c) The locus of lines forming a 45° angle with the outer surface of the windshield at each point along the top and side edges of the outer surface of the windshield and the lower edge of the protected zone determined in S6.1, in the plane perpendicular to the edge at that point.

**S6.3** A template is cut or formed from Styrofoam, type DB, cut cell, to the dimensions of the zone as determined in S6.2. The template is affixed to the windshield so that it delineates the protected zone and remains affixed throughout the crash test.

**S7. Test conditions.** The requirement of S5 shall be met under the following conditions:

**S7.1** The protected zone template is affixed to the windshield in the manner described in S6.

**S7.2** The hood, hood latches, and any other hood retention components are engaged prior to the barrier crash.

**S7.3** Adjustable cowl tops or other adjustable panels in front of the windshield are in the position used under normal operating conditions when windshield wiping systems are not in use.

**S7.4** The parking brake is disengaged and the transmission is in neutral.

**S7.5** Tires are inflated to the vehicle manufacturer's specifications.

**S7.6** The fuel tank is filled to any level from 90 to 95 percent of capacity.

**S7.7** The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S7.6, a passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position.

(b) Except as specified in S7.6, a multipurpose passenger vehicle, truck or bus is loaded to its unloaded vehicle weight, plus 300 pounds or its rated cargo and luggage capacity, whichever is less, secured to the vehicle, plus a 50th-percentile test dummy as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208. Each dummy is restrained only by means that are installed for protection at its seating position. The load is distributed so that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the weight on any axle when the vehicle is loaded to its unloaded vehicle weight plus dummy weight exceeds the axle's proportional share of the test weight, the remaining weight is placed so that the weight on that axle remains the same. For the purposes of this section, unloaded vehicle weight does not include the weight of workperforming accessories.

40 F.R. 25462  
June 16, 1975

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 220

### School Bus Rollover Protection

(Docket No. 75-2; Notice 2)

This notice establishes a new motor vehicle safety Standard No. 220, *School Bus Rollover Protection*, 49 CFR 571.220, specifying performance requirements for the structural integrity of the passenger compartment of school buses when subjected to forces that can be encountered in rollovers.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandate the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, including crashworthiness of the vehicle body and frame. Pub. L. 93-942, section 202 (15 U.S.C. 1392(i)(1)(A)). Based on this mandate and on bus body crashworthiness research (DOT-HS-046-3-694), the NHTSA proposed rollover protection requirements for school buses (40 F.R. 8570, February 28, 1975). Citing statistics on the safety record of school bus operation, several manufacturers questioned whether any standard for school bus rollover protection could be justified.

The Act reflects a need, evidenced in correspondence to the NHTSA from the public, to protect the children who ride in school buses. They and their parents have little direct control over the types of vehicles in which they ride to school, and are not in a position to determine the safety of the vehicles. It is for this reason that the school bus standards must be effective and meaningful.

At the same time, the safety history of school buses does not demonstrate that radical modification of school bus structure would substantially decrease occupant death and injury. As noted in the "School Bus Safety Improvement Program" contract conducted by Ultrasystems, Inc., (DOT-HS-046-3-694) for the NHTSA:

"School buses are a relatively safe mode of human transportation. School bus accident rates and injury/fatality rates on a per-vehicle, per-vehicle-mile, per-passenger-mile, or per-passenger basis are significantly less than for other passenger vehicles. Accidents to school children while enroute to and from school occur primarily in modes other than as school bus passengers. However, school bus safety can and should be improved."

As a practical matter, the amount of structural modification called for in this standard is also limited as a result of the 9-month lead time available to implement the provisions of each school bus standard after its promulgation. The various new requirements imposed in response to the mandate of the Act will require considerable effort by school bus manufacturers to bring their products into conformity in the 9-month period.

The Physicians for Automotive Safety, The National Transportation Safety Board, the Home Insurance Company and other commenters suggested that the NHTSA had ignored the recommendations of the report submitted by Ultrasystems on school bus improvement. The report concluded that the improved school bus design tested by Ultrasystems could withstand a significantly greater load for the same amount of roof crush than existing school bus designs.

In fact, the NHTSA evaluated the test results and Ultrasystems's recommendations carefully. While the percentage of reduction of roof crush would be substantial as a result of the recommended design change, no relationship of this decrease in deflection to improved safety for occupants was established. Ultrasystems reported that increases of \$500 in cost and 530 pounds were incurred to achieve several improve-



ments, including those of the vertical roof crush test.

The recommendations also implied increased structural rigidity but did not evaluate its effect on the amount of energy absorbed by vehicle occupants in a crash. Also, Ultrasystems, did not consider the problems of lead time and retooling costs in making its recommendations. The NHTSA continues to consider that its proposal of  $5\frac{1}{8}$  inches of maximum roof crush under a load equal to  $1\frac{1}{2}$  times the vehicle's unloaded weight provides a satisfactory level of occupant crash protection. Available data do not support the conclusion that a 2- or 3-inch reduction of this crush would significantly improve the level of passenger safety in school buses. It is the intention of the NHTSA to continually review accident statistics relating to school bus safety. Accordingly, future upgrading of the standard will be considered should such action be warranted based upon availability of appropriate data.

In response to inquiries from the Motor Vehicle Manufacturers Association and General Motors as to the origin of the  $5\frac{1}{8}$ -inch requirement, the limit is drawn from the existing School Bus Manufacturers Institute requirement for school bus structural integrity (Static Load Test Code for School Bus Body Structure, issued by the School Bus Manufacturers Institute).

In adopting the  $5\frac{1}{8}$ -inch limit found in the present industry standard, the NHTSA is not merely preserving the status quo. While a manufacturer may have designed its products to meet the industry standard in the past, certain of its products presumably performed either better or worse than the nominal design. Conformity to NHTSA standards, in contrast, requires that every vehicle be capable of meeting the  $5\frac{1}{8}$ -inch limit. This means that the manufacturer must design its vehicles to meet a higher level of performance, to provide a compliance margin for those of its products which fall below the nominal design level. Of course, the manufacturer can reduce the compliance-margin problem without redesign by improving the consistency of its manufacturing processes.

The standard requires that, upon the application of vertical downward force to the bus roof equal to  $1\frac{1}{2}$  times the vehicle's unloaded weight,

the vehicle roof shall not crush more than  $5\frac{1}{8}$  inches, and the emergency exits shall be capable of being opened, with the weight applied, and after its release. The National Transportation Safety Board, the Vehicle Equipment Safety Commission (VESC), Mercedes-Benz, and the Action for Child Transportation Safety organization suggested other methods for evaluation of crashworthiness. The NHTSA has considered these, but concludes that the static test specified in this standard provides a reasonable means to determine crashworthiness without unnecessary testing expense.

Based on submitted comments, the standard varies in some respects from the proposal. The sizes of the force application plates used to apply force and the method of application have been revised to simplify the test procedures and equipment, and to spread the force over larger areas of the vehicle roofs of large and small vehicles. The proposal specified a rigid, rectangular force application plate 36 inches wide and 20 inches shorter than the vehicle roof, preventing reliance on the roof end structures for rollover protection in typical body-on-chassis construction. Commenters pointed out that the end structures of the roof are almost certain to bear the weight of a rollover and should be included in a test of a vehicle's crashworthiness. Several manufacturers and other commenters recommended an increase in the size of the force application plate, in order to permit the foremost and rearmost roof "bows" of their buses to absorb a portion of the test load. Ford Motor Company stated it had performed the test as proposed and asserted that the roof of its van-type vehicle, as presently designed could not meet the requirement without an increase in the size of the force application plate to distribute the load over the entire vehicle roof. Chrysler Corporation stated it would find it necessary to discontinue production of small school buses because of redesign costs if the requirements were adopted as proposed.

With a view to the safety record of school buses and the 9-month lead time, the NHTSA concludes that the force application plate can be modified so that an additional "bow" or "bows" bear part of the applied force. It is the NHTSA's view that a change to permit both



roof end structures to fully contribute to support of the applied force in the case of buses of more than 10,000 pounds would be a relaxation of current industry practices. Accordingly, the extent of change recommended by the industry is not adopted. The NHTSA concludes that an 8-inch increase in the length of the force application plate is sufficient to allow some portion of the applied force to be absorbed by the end bows of the roof while maintaining adequate crash protection. Therefore, for these buses the width of the plate remains as proposed while the length of the plate is increased 8 inches.

In the case of lighter buses, which are generally of the van type, the NHTSA has increased both the width and length of the plate to encompass the entire roof.

The procedure for applying force through the plate has also been modified in some respects. Many comments objected that the procedure required an expensive, complex hydraulic mechanism that would increase the costs of compliance without justification. The proposal specified an "evenly-distributed vertical force in a downward direction through the force application plate", starting with the plate horizontal. Commenters interpreted these specifications to mean that the vehicle would be required to absorb the energy in evenly-distributed fashion and that the horizontal attitude of the plate must be maintained.

Actually these specifications were included in the proposed method to advise manufacturers of the precise procedures to be employed in compliance testing of their products. Understanding that some manufacturers may choose to achieve the required force application by applying weights evenly over the surface of the plate, the standard specified an "evenly-distributed force" to eliminate other methods (such as a concentrated force at one end of the plate) that could unfairly test the vehicle structure. The horizontal attitude of the plate was also intended to establish a beginning point for testing on which a manufacturer can rely. While these specifications establish the exact circumstances under which vehicles can be tested, a manufacturer can depart from them as long as it can be shown that the vehicle would comply if tested exactly as specified. In place of the perfectly rigid plate called for in the standard, for example, a manu-

facturer could employ a plate of sufficient stiffness to ensure that the test results are not affected by the lack of rigidity.

Some modification of the test procedures has been made for simplification and clarity. To permit placement of the plate on the roof to begin testing without a suspension mechanism, the specification for horizontal attitude is modified to permit the plate to depart from the horizontal in the fore and aft direction only. Some manufacturers considered the initial application of force as an unnecessary complication. However, the initial force application of 500 pounds has been retained in order to permit elimination of inconsequential deformation of the roof structure prior to measurement of the permissible  $5\frac{1}{8}$  inches of deflection. In instances where the force application plate weighs more than 500 pounds, some type of suspension mechanism could be used temporarily to constrain the load level to the initial value, if the manufacturer decides to conduct his testing exactly as specified in the standard's procedures.

The requirement that force be applied "through the plate" has been changed to "to the plate" in order to avoid a misunderstanding that the vehicle must absorb energy evenly over the surface of its roof.

As proposed by several commenters, the rate of application in pounds per minute has been changed to inches per second, specifically "at any rate not more than  $\frac{1}{2}$  inch per second." Manufacturers should understand that "any" in this context is defined by the NHTSA (49 CFR § 571.4) to mean that the vehicle roof must satisfy the requirement at every rate of application within the stated range. General Motors reports that as a practical matter, the effect of speed in rate of application for tests of this nature is not significant in the range of 0.12 inches per second to 1 inch per second.

The requirement that movement "at any point" on the plate not exceed  $5\frac{1}{8}$  inches has not been modified despite some objections. The NHTSA considers it reasonable that excessive crush not be permitted at the extremities of the plate. Measurement of movement only at the center of the plate, for example, would permit total collapse of the structure in any direction as long as one point on the bus maintained its integrity.

The preparation of the vehicle for the application of force has been modified to specify replacement of non-rigid body mounts with equivalent rigid mounts. The compression of deformable body mounts is unrelated to crash-worthiness of the structure and can therefore be eliminated to permit testing of the structure itself.

Accessories or components which extend upward from the vehicle's roof (such as school bus lights) are removed for test purposes. It is also noted that the vehicle's transverse frame members or body sills are supported for test purposes. In response to a question from Blue Bird Body Company, a frame simulator may be used along with any other variations as long as the manufacturer assures himself that the vehicle would conform if tested precisely as specified in the standard.

The vehicle's emergency exits must also be capable of opening when the required force is applied, and following release of the force. As noted in comments, this requirement simulates the use of the exits after a rollover, whether or not the vehicle comes to rest on its roof. The proposed requirement of ability to close these exits is eliminated because such a capability is unnecessary in an emergency evacuation of the bus. For this reason, the requirement has been modified so that a particular test specimen (*i.e.*, a particular bus) will not be required to meet requirements for emergency exits which open following release of force, if the exits have already been tested while the application force is maintained.

With regard to the requirements as a whole, Crown Coach and other manufacturers argued that the application of  $1\frac{1}{2}$  times the vehicle's unloaded weight unfairly discriminates against buses with a higher vehicle weight-to-passenger ratio. The NHTSA disagrees, and notes that the relevant consideration in rollover is the weight of the vehicle itself in determining the energy to be absorbed by the structure. In a related area, one manufacturer suggested that the increased weight of the NHTSA's contemplated new standards for school buses would increase unloaded vehicle weight to the point where redesign would be required to meet the rollover standard. The NHTSA has considered this

issue and estimates that the only significant new weight would be for improved seating. This weight increase would not substantially increase the severity of the rollover standard.

The State of California suggested consolidation of the rollover standard with the joint strength. While such a consolidation would appear logical for school buses alone, the NHTSA prefers the flexibility of separate standards with a view to their use independently in the future for other vehicle types. For example, the application of vertical force to the vehicle structure may be appropriate in a vehicle for which the joint strength requirement would not be appropriate.

The State of Georgia requested that transit systems transporting school children be exempted from Standard No. 220. This commenter apparently misunderstood the applicability of the standard. It only applies to newly-manufactured vehicles and does not require modification of existing fleets, whether or not operated by a transit authority.

Interested persons should note that the NHTSA has issued a proposal to modify the definition of "school bus" (40 F.R. 40854, September 1, 1975) and that if that definition is adopted the requirements of this standard will apply to all vehicles that fall within the definition, whether or not they fall within the present definition.

In consideration of the foregoing, a new motor vehicle safety standard No. 220, *School Bus Rollover Protection*, is added as § 571.220 of Part 571 of Title 49, Code of Federal Regulations. . . .

*Effective date:* October 26, 1976.

The effective date of this standard is established as 9 months after the date of its issuance, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, section 202 (15 U.S.C. 1397(i)(1)(A)).

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); § 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.51)

Issued on January 22, 1976.

Howard J. Dugoff  
Acting Administrator  
**41 F.R. 3874**  
**January 27, 1976**



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 220****School Bus Rollover Protection**

(Docket No. 73-3; Notice 7)

(Docket No. 73-20; Notice 10)

(Docket No. 73-34; Notice 4)

(Docket No. 75-2; Notice 3)

(Docket No. 75-3; Notice 5)

(Docket No. 75-7; Notice 3)

(Docket No. 75-24; Notice 3)

This notice announces that the effective dates of the redefinition of "school bus" and of six Federal motor vehicle safety standards as they apply to school buses are changed to April 1, 1977, from the previously established effective dates. This notice also makes a minor amendment to Standard No. 220, *School Bus Rollover Protection*, and adds a figure to Standard No. 221, *School Bus Body Joint Strength*.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandated the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, Pub. L. 93-492, § 202 (15 U.S.C. § 1392 (i)(1)(A)). These amendments included a definition of school bus that necessitated a revision of the existing definition used by the NHTSA in establishing safety requirements. The Act also specified that the new requirements "apply to each school bus and item of school bus equipment which is manufactured . . . on or after the expiration of the 9-month period which begins on the date of promulgation of such safety standards." (15 U.S.C. § 1392(i)(1)(B)).

Pursuant to the Act, amendments were made to the following standards: Standard No. 301-75, *Fuel System Integrity* (49 CFR 571.301-75), effective July 15, 1976, for school buses not already covered by the standard (40 FR 483521, October 15, 1975); Standard No. 105-75, *Hydraulic Brake Systems* (49 CFR 571.105-75), effective October 12, 1976 (41 FR 2391, January

16, 1976); and Standard No. 217, *Bus Window Retention and Release* (49 CFR 571.217), effective for school buses on October 26, 1976 (41 FR 3871, January 27, 1976).

In addition, the following new standards were added to Part 571 of Title 49 of the Code of Federal Regulations, effective October 26, 1976: Standard No. 220, *School Bus Rollover Protection* (41 F.R. 3874, January 27, 1976); Standard No. 221, *School Bus Body Joint Strength* (41 F.R. 3872, January 26, 1976); and Standard No. 222, *School Bus Passenger Seating and Crash Protection* (41 F.R. 4016, January 28, 1976). Also, the existing definition of "school bus" was amended, effective October 27, 1976, in line with the date set by the Act for issuance of the standards.

The Act was recently amended by Public Law 94-346 (July 8, 1976) to change the effective dates of the school bus standards to April 1, 1977 (15 U.S.C. § 1392(i)(1)(B)). This notice is intended to advise interested persons of these changes of effective dates. In the case of Standard No. 301-75, the change of effective date is reflected in a conforming amendment to S5.4 of that standard. A similar amendment is made in S3 of Standard No. 105-75.

The agency concludes that the October 27, 1976, effective date for the redefinition of "school bus" should be postponed to April 1, 1977, to conform to the new effective dates for the upcoming requirements. If this were not done, the new classes



of school buses would be required to meet existing standards that apply to school buses (e.g., Standard No. 108 (49 CFR 571.108)) before being required to meet the new standards. This would result in two stages of compliance, and would complicate the redesign efforts that Congress sought to relieve.

This notice also amends Standard No. 220 in response to an interpretation request by Blue Bird Body Company, and Sheller-Globe Corporation's petition for reconsideration of the standard. Both companies request confirmation that the standard's requirement to operate emergency exits during the application of force to the vehicle roof (S4(b)) does not apply to roof exits which are covered by the force application plate. The agency did not intend to require the operation of roof exits while the force application plate is in place on the vehicle. Accordingly, an appropriate amendment has been made to S4(b) of the standard.

With regard to Standard No. 220, Sheller-Globe also requested confirmation that, in testing its school buses that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less, it may test with a force application plate with dimensions other than those specified in the standard. The standard does not prohibit a manufacturer from using a different dimension from that specified, in view of the NHTSA's expressed position on the legal effect of its regulations. To certify compliance, a manufacturer is free to choose any means, in the exercise of due care, to show that a vehicle (or item of motor vehicle equipment) would comply if tested by the NHTSA as specified in the standard. Thus the force application plate used by the NHTSA need not be duplicated by each manufacturer or compliance test facility. Sheller-Globe, or example, is free to use a force application plate of any width as long as it can certify its vehicle would comply if tested by the NHTSA according to the standard.

In a separate area, the agency corrects the inadvertent omission of an illustration from Standard No. 221 as it was issued January 26, 1976 (41 F.R. 3872). The figure does not differ from that proposed and, in that form, it received no adverse comment.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 F.R. 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The changes in effective dates for the school bus standards are not evaluated because they were accomplished by law and not by regulatory action.

The change of effective date for the redefinition of "school bus" will result in savings to manufacturers who will not be required to meet existing school bus standards between October 27, 1976, and April 1, 1977. The agency calculates that the only standard that would not be met would be the requirement in Standard No. 108 for school bus marker lamps. In view of the agency's existing provision for the marking of light school buses in Pupil Transportation Standard No. 17 (23 CFR 1204), it is concluded that the absence of this equipment until April 1, 1977, will not have a significant adverse impact on safety.

The interpretative amendment of Standard No. 220 and the addition of a figure to Standard No. 221 are not expected to affect the manufacture or operation of school buses.

In consideration of the foregoing, Part 571 of Title 49 of the Code of Federal Regulations is amended. . . .

*Effective dates:*

1. Because the listed amendments do not impose additional requirements of any person, the National Highway Traffic Safety Administration finds that an immediate effective date of August 26, 1976 is in the public interest.

2. The effective date of the redefinition of "school bus" in 49 CFR Part 571.3 that was published in the issue of December 31, 1976 (40 F.R. 60033) is changed to April 1, 1977.

3. The effective dates of Standard Nos. 105-75, 217, 301-75, 220, 221, and 222 (as they apply to school buses) are April 1, 1977, in accordance with Public Law 94-346.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718  
(15 U.S.C. 1392, 1407) ; Pub. L. 94-346, Stat. (15  
U.S.C. § 1392(i) (1) (B)) ; delegation of authority  
at 49 CFR 1.50.)

Issued on August 17, 1976.

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**Effective: August 26, 1976**

**John W. Snow**  
**Administrator**

**41 F.R. 36027**  
**August 26, 1976**





## MOTOR VEHICLE SAFETY STANDARD NO. 220

### School Bus Rollover Protection

**S1. Scope.** This standard establishes performance requirements for school bus rollover protection.

**S2. Purpose.** The purpose of this standard is to reduce the number of deaths and the severity of injuries that result from failure of the school bus body structure to withstand forces encountered in rollover crashes.

**S3. Applicability.** This standard applies to school buses.

**S4. Requirements.** When a force equal to  $1\frac{1}{2}$  times the unloaded vehicle weight is applied to the roof of the vehicle's body structure through a force application plate as specified in S5., Test procedures—

(a) The downward vertical movement at any point on the application plate shall not exceed  $5\frac{1}{8}$  inches; and

(b) Each emergency exit of the vehicle provided in accordance with Standard No. 217 (§ 571.217) shall be capable of opening as specified in that standard during the full application of the force and after release of the force, except that an emergency exit located in the roof of the vehicle is not required to be capable of being opened during the application of the force. A particular vehicle (*i.e.*, test specimen) need not meet the emergency opening requirement after release of force if it is subjected to the emergency exit opening requirements during the full application of the force.

**S5. Test procedures.** Each vehicle shall be capable of meeting the requirements of S4. when tested in accordance with the procedures set forth below.

**S5.1** With any non-rigid chassis-to-body mounts replaced with equivalent rigid mounts,

place the vehicle on a rigid horizontal surface so that the vehicle is entirely supported by means of the vehicle frame. If the vehicle is constructed without a frame, place the vehicle on its body sills. Remove any components which extend upward from the vehicle roof.

**S5.2** Use a flat, rigid, rectangular force application plate that is measured with respect to the vehicle roof longitudinal and lateral centerlines;

(a) In the case of a vehicle with a GVWR of more than 10,000 pounds, 12 inches shorter than the vehicle roof and 36 inches wide; and

(b) In the case of a vehicle with a GVWR of 10,000 pounds or less, 5 inches longer and 5 inches wider than the vehicle roof. For purposes of these measurements, the vehicle roof is that structure, seen in the top projected view, that coincides with the passenger and driver compartment of the vehicle.

**S5.3** Position the force application plate on the vehicle roof so that its rigid surface is perpendicular to a vertical longitudinal plane and it contacts the roof at not less than two points, and so that, in the top projected view, its longitudinal centerline coincides with the longitudinal centerline of the vehicle, and its front and rear edges are an equal distance inside the front and rear edges of the vehicle roof at the centerline.

**S5.4** Apply an evenly-distributed vertical force in the downward direction to the force application plate at any rate not more than 0.5 inch per second, until a force of 500 pounds has been applied.

**S5.5** Apply additional vertical force in the downward direction to the force application plate at a rate of not more than 0.5 inch per second

until the force specified in S4 has been applied, and maintain this application of force.

**S5.6** Measure the downward movement of any point on the force application plate which occurred during the application of force in accordance with S5.5.

**S5.7** To test the capability of the vehicle's emergency exits to open in accordance with S4(b)—

(a) In the case of testing under the full application of force, open the emergency exits as specified in S4(b) while maintaining the force applied in accordance with S5.4 and S5.5; and

(b) In the case of testing after the release of all force, release all downward force applied to the force application plate and open the emergency exits as specified in S4(b).

**S6. Test conditions.** The following conditions apply to the requirements specified in S4.

**S6.1 Temperature.** The ambient temperature is any level between 32° F. and 90° F.

**S6.2 Windows and doors.** Vehicle windows, doors, and emergency exits are in fully-closed position, and latched but not locked.

**41 F.R. 3874  
January 27, 1976**

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 221

### School Bus Body Joint Strength

(Docket No. 73-34; Notice 3)

This notice establishes a new motor vehicle safety standard, No. 221; *School Bus Body Joint Strength*, 49 CFR 571.221, specifying a minimum performance level for school bus body panel joints.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (Pub. L. 93-492, 88 Stat. 1470, herein, the Act) require the issuance of minimum requirements for school bus body and frame crashworthiness. This rulemaking is pursuant to authority vested in the Secretary of Transportation by the Act and delegated to the Administrator of the NHTSA, and is preceded by notices of proposed rulemaking issued January 29, 1974 (39 F.R. 2490) and March 13, 1975 (40 F.R. 11738).

One of the significant injury-producing characteristics of school bus accidents, exposure to sharp metal edges, occurs when body panels become separated from the structural components to which they have been fastened. In an accident severe lacerations may result if the occupants of the bus are tossed against these edges. Moreover, if panel separation is great the component may be ejected from the vehicle, greatly increasing the possibility of serious injury.

This standard is intended to lessen the likelihood of these modes of injury by requiring that body joints on school buses have a tensile strength equal to 60 percent of the tensile strength of the weakest joined body panel, as suggested by the Vehicle Equipment Safety Commission (VESC). The NHTSA has determined that this is an appropriate level of performance for body joints and that its application to school buses is both reasonable and practicable. Furthermore, the NHTSA believes that adoption

of this standard will provide an effective and meaningful solution to the body panel problem.

It is anticipated that this rule will burden manufacturers only to the extent of requiring the installation of more rivets than are currently used. The NHTSA has reviewed the economic and environmental impact of this proposal and determined that neither will be significant.

In their response to the two NHTSA proposals on this subject, several of the commenters suggested that the standard could be met by reducing the strength of the panel rather than increasing the strength of the joint, and that a minimum joint strength should be required. For several reasons the NHTSA does not believe that a minimum absolute joint strength is desirable at this time. While this standard will tend to increase the overall strength of buses, it is not designed to set minimum body panel strength requirements. Its purpose is to prevent panels from separating at the joint in the event of an accident. In order to deal with the problem of laceration, this regulation must be applicable to both exterior and interior joints. An absolute minimum joint strength requirement would be constrained by the level of performance appropriate for the relatively thin interior panels. Thus, the overall level of performance could not be defined in a meaningful fashion without severely and unnecessarily limiting the manufacturer's flexibility in designing his product. The NHTSA School Bus Rollover Protection Standard (49 CFR 571.220), which specifies requirements for the structural integrity of school bus bodies, should result in a practical lower limit on panel strength and thereby set a practical absolute minimum joint strength.



The NHTSA has no evidence that the mode of failure found in the larger traditional school buses also occurs in smaller, van-type school buses currently manufactured by automobile manufacturers for use as 11- to 17-passenger school buses. Ford Motor Company commented that the mode of injury sought to be prevented by this standard does not occur in accidents involving school buses converted from multipurpose passenger vehicles (vans). Chrysler Corporation suggested that the proposed requirement is inappropriate when applied to vans with "coach" joint construction. Based on these comments, the NHTSA has determined that until information to the contrary appears or is developed these vehicles should not be covered by the requirement. Accordingly, the application of the standard has been limited to school buses with a gross vehicle weight rating over 10,000 pounds.

Several commenters suggested that certain types of joints might not be susceptible of testing in the manner specified in this regulation. Up to this time the NHTSA has not found sufficient evidence in support of that position to justify amending the standard. If information is re-

ceived indicating that different test methods are required for certain applications, appropriate action will be initiated.

In consideration of the foregoing, a new motor vehicle safety standard, No. 221, *School Bus Body Joint Strength*, is added as § 571.221 of Part 571 of Title 49, Code of Federal Regulations, as set forth below.

*Effective date:* October 26, 1976.

The effective date of this standard is 9 months after the date of issuance, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, section 202 (15 U.S.C. 1397(i)(1)(A)).

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); § 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on January 22, 1976.

Howard J. Dugoff  
Acting Administrator

41 F.R. 3872  
January 27, 1976

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 221

## School Bus Body Joint Strength

(Docket No. 73-3; Notice 7)

(Docket No. 73-20; Notice 10)

(Docket No. 73-34; Notice 4)

(Docket No. 75-2; Notice 3)

(Docket No. 75-3; Notice 5)

(Docket No. 75-7; Notice 3)

(Docket No. 75-24; Notice 3)

This notice announces that the effective dates of the redefinition of "school bus" and of six Federal motor vehicle safety standards as they apply to school buses are changed to April 1, 1977, from the previously established effective dates. This notice also makes a minor amendment to Standard No. 220, *School Bus Rollover Protection*, and adds a figure to Standard No. 221, *School Bus Body Joint Strength*.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandated the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, Pub. L. 93-492, § 202 (15 U.S.C. § 1392(i)(1)(A)). These amendments included a definition of school bus that necessitated a revision of the existing definition used by the NHTSA in establishing safety requirements. The Act also specified that the new requirements "apply to each schoolbus and item of schoolbus equipment which is manufactured . . . on or after the expiration of the 9-month period which begins on the date of promulgation of such safety standards." (15 U.S.C. § 1392(i)(1)(B)).

Pursuant to the Act, amendments were made to the following standards: Standard No. 301-75, *Fuel System Integrity* (49 CFR 571.301-75), effective July 15, 1976, for school buses not already covered by the standard, (40 F.R. 483521, October 15, 1975); Standard No. 105-75, *Hydraulic Brake Systems* (49 CFR 571.105-75), effective October 12, 1976 (41 F.R. 2391, Jan-

uary 16, 1976); and Standard No. 217, *Bus Window Retention and Release* (49 CFR 571.217), effective for school buses on October 26, 1976 (41 F.R. 3871, January 27, 1976).

In addition, the following new standards were added to Part 571 of Title 49 of the Code of Federal Regulations, effective October 26, 1976: Standard No. 220, *School Bus Rollover Protection* (41 F.R. 3874, January 27, 1976); Standard No. 221, *School Bus Body Joint Strength* (41 F.R. 3872, January 26, 1976); and Standard No. 222, *School Bus Passenger Seating and Crash Protection* (41 F.R. 4016, January 28, 1976). Also, the existing definition of "school bus" was amended, effective October 27, 1976, in line with the date set by the Act for issuance of the standards.

The Act was recently amended by Public Law 94-346 (July 8, 1976) to change the effective dates of the school bus standards to April 1, 1977 (15 U.S.C. § 1392(i)(1)(B)). This notice is intended to advise interested persons of these changes of effective dates. In the case of Standard No. 301-75, the change of effective date is reflected in a conforming amendment to S5.4 of that standard. A similar amendment is made in S3 of Standard No. 105-75.

The agency concludes that the October 27, 1976, effective date for the redefinition of "school bus" should be postponed to April 1, 1977, to conform

to the new effective dates for the upcoming requirements. If this were not done, the new classes of school buses would be required to meet existing standards that apply to school buses (e.g., Standard No. 108 (49 CFR 571.108)) before being required to meet the new standards. This would result in two stages of compliance, and would complicate the redesign efforts that Congress sought to relieve.

This notice also amends Standard No. 220 in response to an interpretation request by Blue Bird Body Company, and Sheller-Globe Corporation's petition for reconsideration of the standard. Both companies request confirmation that the standard's requirement to operate emergency exits during the application of force to the vehicle roof (S4(b)) does not apply to roof exits which are covered by the force application plate. The agency did not intend to require the operation of roof exits while the force application plate is in place on the vehicle. Accordingly, an appropriate amendment has been made to S4(b) of the standard.

With regard to Standard No. 220, Sheller-Globe also requested confirmation that, in testing its school buses that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less, it may test with a force application plate with dimensions other than those specified in the standard. The standard does not prohibit a manufacturer from using a different dimension from that specified, in view of the NHTSA's expressed position on the legal effect of its regulations. To certify compliance, a manufacturer is free to choose any means, in the exercise of due care, to show that a vehicle (or item of motor vehicle equipment) would comply if tested by the NHTSA as specified in the standard. Thus the force application plate used by the NHTSA need not be duplicated by each manufacturer or compliance test facility. Sheller-Globe, for example, is free to use a force application plate of any width as long as it can certify its vehicle would comply if tested by the NHTSA according to the standard.

In a separate area, the agency corrects the inadvertent omission of an illustration from Standard No. 221 as it was issued January 26, 1976 (41 F.R. 3872). The figure does not differ from that proposed and, in that form, it received no adverse comment.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 F.R. 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The changes in effective dates for the school bus standards are not evaluated because they were accomplished by law and not by regulatory action.

The change of effective date for the redefinition of "school bus" will result in savings to manufacturers who will not be required to meet existing school bus standards between October 27, 1976, and April 1, 1977. The agency calculates that the only standard that would not be met would be the requirement in Standard No. 108 for school bus marker lamps. In view of the agency's existing provision for the marking of light school buses in Pupil Transportation Standard No. 17 (23 CFR 1204), it is concluded that the absence of this equipment until April 1, 1977, will not have a significant adverse impact on safety.

The interpretative amendment of Standard No. 220 and the addition of a figure to Standard No. 221 are not expected to affect the manufacture or operation of school buses.

In consideration of the foregoing, Part 571 of Title 49 of the Code of Federal Regulations is amended. . . .

*Effective dates:*

1. Because the listed amendments do not impose additional requirements of any person, the National Highway Traffic Safety Administration finds that an immediate effective date of August 26, 1976 is in the public interest.

2. The effective date of the redefinition of "school bus" in 49 CFR Part 571.3 that was published in the issue of December 31, 1976 (40 F.R. 60033) is changed to April 1, 1977.

3. The effective dates of Standard Nos. 105-75, 217, 301-75, 220, 221, and 222 (as they apply to school buses) are April 1, 1977, in accordance with Public Law 94-346.



**Effective: August 26, 1976**

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718  
(15 U.S.C. 1392, 1407) ; Pub. L. 94-346, Stat. (15  
U.S.C. § 1392(i) (1) (B)) ; delegation of authority  
at 49 CFR 1.50).

Issued on August 17, 1976.

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**John W. Snow**  
**Administrator**

**41 F.R. 36027**  
**August 26, 1976**



## MOTOR VEHICLE SAFETY STANDARD NO. 221

### School Bus Body Joint Strength

**S1. Scope.** This standard establishes requirements for the strength of body panel joints in school bus bodies.

**S2. Purpose.** The purpose of this standard is to reduce deaths and injuries resulting from the structural collapse of school bus bodies during crashes.

**S3. Application.** This standard applies to school buses with gross vehicle weight ratings of more than 10,000 pounds.

#### S4. Definitions.

“Body component” means a part of a bus body made from a single piece of homogeneous material or from a single piece of composite material such as plywood.

“Body panel” means a body component used on the exterior or interior surface to enclose the bus’ occupant space.

“Body panel joint” means the area of contact or close proximity between the edges of a body panel and another body component, excluding spaces designed for ventilation or another functional purpose, and excluding doors, windows, and maintenance access panels.

“Bus body” means the portion of a bus that encloses the bus’ occupant space, exclusive of the bumpers, the chassis frame, and any structure forward of the forwardmost point of the windshield mounting.

**S5. Requirement.** When tested in accordance with the procedure of S6, each body panel joint shall be capable of holding the body panel to the member to which it is joined when subjected to a force of 60% of the tensile strength of the weakest joined body panel determined pursuant to S6.2.

#### S6. Procedure.

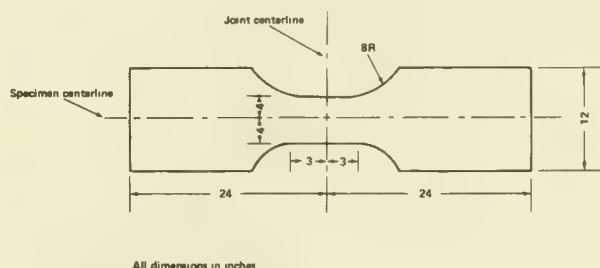
##### S6.1 Preparation of the test specimen.

**S6.1.1** If a body panel joint is 8 inches long or longer, cut a test specimen that consists of any randomly selected 8-inch segment of the joint, together with a portion of the bus body whose dimensions, to the extent permitted by the size of the joined parts, are those specified in Figure 1, so that the specimen’s centerline is perpendicular to the joint at the midpoint of the joint segment. Where the body panel is not fastened continuously, select the segment so that it does not bisect a spot weld or a discrete fastener.

**S6.1.2** If a joint is less than 8 inches long, cut a test specimen with enough of the adjacent material to permit it to be held in the tension testing machine specified in S6.3.

**S6.1.3** Prepare the test specimen in accordance with the preparation procedures specified in the 1973 edition of the Annual Book of ASTM Standards, published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

FIGURE 1





**S6.2 Determination of minimum allowable strength.** For purposes of determining the minimum allowable joint strength, determine the tensile strengths of the joined body components as follows:

(a) If the mechanical properties of a material are specified by the American Society for Testing and Materials, the relative tensile strength for such a material is the minimum tensile strength specified for that material in the 1973 edition of the Annual Book of ASTM Standards.

(b) If the mechanical properties of a material are not specified by the American Society for Testing and Materials, determine its tensile strength by cutting a specimen from the bus body outside the area of the joint and by testing it in accordance with S6.3.

### **S6.3 Strength test.**

**S6.3.1** Grip the joint specimen on opposite sites of the joint in a tension testing machine calibrated in accordance with Method E4, Verification of Testing Machines, of the American Society for Testing and Materials (1973 Annual Book of ASTM Standards).

**S6.3.2** Adjust the testing machine grips so that the joint, under load, will be in stress approximately perpendicular to the joint.

**S6.3.3** Apply a tensile force to the specimen by separating the heads of the testing machine at any uniform rate not less than  $\frac{1}{8}$  inch and not more than  $\frac{3}{8}$  inch per minute until the specimen separates.

**41 F.R. 3872**  
**January 27, 1976**

## PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 222

### School Bus Seating and Crash Protection

(Docket No. 73-3; Notice 5)

This notice establishes a new motor vehicle safety Standard No. 222, *School Bus Seating and Crash Protection*, that specifies seating, restraining barrier, and impact zone requirements for school buses.

The Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, directed the issuance of a school bus seating systems performance standard (and other standards in seven areas of vehicle performance). The NHTSA had already issued two proposals for school bus seating systems prior to enactment of the 1974 Safety Amendments (the Act) (38 F.R. 4776, February 22, 1973) (39 F.R. 27585, July 30, 1974) and subsequently published two additional proposals (40 F.R. 17855, April 23, 1975) (40 F.R. 47141, October 8, 1975). Each aspect of the requirements was fully considered in the course of this rulemaking activity. Comments received in response to the most recent proposal were limited to a few aspects of the Standard.

The largest number of comments were received on the requirement that school bus passenger seats be equipped with seat belt anchorages at each seating position. The standard relies on compartmentalization between well-padded and well-constructed seats to provide occupant protection on school buses (other than van-type buses). At the same time, seat belt anchorages were proposed so that a greater measure of protection could be gained if a particular user chose to use the anchorages by installation of seat belts together with a system to assure that seat belts would be worn, properly adjusted, and not misused.

Bus operators strongly expressed the view that the presence of seat belt anchorages would encourage the installation of seat belts by school

districts without providing the necessary supervision of their use. This association of school bus operators (National School Transportation Association) also questioned the benefits that would be derived from anchorage installation as long as their utilization is not required. In view of these factors, and the indications that in any event only a small fraction of school buses would have belts installed and properly used, the NHTSA concludes that the proposed seat belt anchorage requirement should not be included in this initial school bus seating standard. Further study of the extent to which belts would be installed and properly used should permit more certainty as the basis for any future action.

NHTSA calculations demonstrate that the strength characteristics of the seat specified by the standard to provide the correct amount of compartmentalization also provide the strength necessary to absorb seat belt loads. This means that an operator or school district may safely attach seat belts to the seat frame, even where anchorages are not installed as original equipment. The seat is strong enough to take the force of occupants against the seat back if no belts are utilized, or the force of occupants against seat belts if occupants are restrained by belts attached to the seat frame through the anchorages provided.

The Physicians for Automotive Safety (PAS) requested that lap belts be required in addition to the compartmentalization offered by the seating systems. The agency concluded earlier in this rulemaking procedure that compartmentalization provides satisfactory protection and that a requirement for belts without the assurance of proper supervision of their use would not be an effective means of providing occupant protection.

PAS has not provided data or arguments that would modify this conclusion, and its request is therefore denied.

PAS, relying on testing undertaken at the University of California at Los Angeles in 1967 and 1969, argued that a vertical seat back height of 24 inches above the seating reference point (SRP) is necessary to afford adequate protection against occupant injury. The NHTSA, as noted in its fourth notice of school bus crash protection, based its 20-inch requirement on newer data generated in dynamic and static testing by AMF Corporation of prototype seats designed to meet the proposed requirements of the standard ("Development of a Unitized School Bus", DOT-HS-400969). While the NHTSA does not dispute that a properly constructed, higher seat back provides more protection than a lower seat back, the data support the agency's determination that the 20-inch seat back provides a reasonable level of protection. School bus accident data do not provide substantial evidence of a whiplash injury experience that could justify a 4-inch increase in seat back height. For this reason, the seat back height is made final as proposed.

Several commenters objected to applicability of the standard to school buses with a gross vehicle weight rating (GVWR) of 10,000 pounds or less (light school buses), asserting that the special requirements of the standard for those buses were inappropriate, or unachievable within the 9-month leadtime for compliance mandated by the Act.

Chrysler Corporation requested exclusion of light school buses from this standard for an indefinite period, and Ford Motor Company requested that essentially the same package of standards as already are provided in its van-type multi-purpose passenger vehicles and school bus models be required in the future, with no additional protection. Both companies believe that the relatively small numbers of their vehicles sold as school buses would have to be withdrawn from the market because of the expense of tooling new seating that offers more crash protection than present seating. Wayne Corporation manufactures a light school bus that is not based on a van-type vehicle, and requested that seats used

in its larger models be permitted in smaller models, along with seat belts that comply with Standard No. 209.

The Congressional direction to issue standards for school bus seating systems (15 U.S.C. § 1392(i)(1)(A)(iv)) implies that existing seating and occupant crash protection standards are insufficient for vehicles that carry school children. The NHTSA has proposed a combination of requirements for light school buses that differ from those for heavier buses, because the crash pulse experienced by smaller vehicles is more severe than that of larger vehicles in similar collisions. The standard also specifies adequate numbers of seat belts for the children that the vehicle would carry, because such restraints are necessary to provide adequate crash protection in small vehicles. The requirements applicable to light school buses are considered reasonable, and are therefore included in the final rule as proposed.

In Wayne's case, it is not clear why the seat it has developed for heavier school buses will not serve in its smaller school buses. Seat belts may need to be attached to the floor to support the force specified by Standard No. 210 for anchorages. Also, some interior padding may be necessary to meet the vehicle impact zone requirements of S5.3.1.1(a).

Sheller-Globe Corporation (Sheller) and Wayne considered unreasonable the standard's limitation on maximum distance between a seat's SRP and the rear surface of the seat or restraining barrier forward of the SRP (S5.2). The limitation exists to minimize the distance an occupant travels before forward motion is arrested by the padded structure that compartmentalizes the occupant. The two bus manufacturers contend that they must also comply with State requirements for a minimum distance between seats that results in only 1 inch of tolerance in seating placement.

Section 103(d) of the National Traffic and Motor Vehicle Safety Act provides in part:

(d) Whenever a Federal motor vehicle safety standard . . . is in effect, no State or political subdivision of a State shall have any authority either to establish or continue in effect, with respect to any motor vehicle or item of motor vehicle equipment any safety standard appli-



cable to the same aspect of performance of such vehicle or item of equipment which is not identical to the Federal standard.

It is the opinion of the NHTSA that any State requirement relating to seat spacing, other than one identical to the Federal requirement for maximum spacing of 20 inches from the SRP, is preempted under § 103(d), 15 U.S.C. § 1392(d).

Sheller advocated wider seat spacing for activity buses, because seats are occupied for longer periods of time on road trips. The NHTSA, noting that activity buses are often used on the open highway at high speeds for long periods of time, requests comments on the advisability of specifying a seat belt requirement in place of the seat spacing requirement in the case of these buses.

Much of Sheller and Wayne's concern over tolerances may stem from a misunderstanding of the meaning of "seating reference point" (SRP). As defined by the NHTSA (49 CFR 571.3), the SRP is essentially the manufacturer's design reference point which simulates the pivot center of the human torso and thigh, located in accordance with the SAE Standard J826. Thus the manufacturer calculates, on its seat design seen in side projected view, the pivot center of the human torso and thigh of the potential seat occupant, and then establishes a design reference point that simulates the location of the actual pivot center. The NHTSA has interpreted that this design reference point may be fixed by the manufacturer with reference to the seating structure to simplify calculation of its location in a bus for purposes of measurement and compliance.

Sheller also requested that the "seat performance forward" testing be simplified by eliminating the 8-inch range of locations at which the lower loading bar can be applied against the seat back. As noted in the preamble to Notice 4 of this docket in response to a similar request from Blue Bird Body Company, the NHTSA declines to make this restriction, to discourage the addition of a narrow 2-inch wide structural member at this point simply to meet the requirement. This reasoning remains valid and Sheller's request is denied.

Sheller also asked that the requirement for forward-facing seats be eliminated from the standard, in view of the practice of installing side-facing seats in some buses for handicapped students. The NHTSA designed the seating system in this standard for protection from fore and aft crash forces, and considers it necessary that the seats be forward-facing to achieve the objective of occupant protection. Comments are solicited on whether the provision of this protection in special vehicles is impractical.

The Vehicle Equipment and Safety Commission (VESC) asked for a minimum seat width of 13 inches for each designated seating position, noting that the standard's formula permits seating of 12.67 inches in width. The agency does not believe its standard will encourage seats narrower than those presently provided in school buses, but will watch for any indication that that is occurring. Action can be taken in the future if it appears that seating is being designed to be narrower than at present.

In consideration of the foregoing, a new motor vehicle safety Standard No. 222, *School Bus Seating and Crash Protection*, is added as § 571.222, of Part 571 of Title 49, Code of Federal Regulations. . . .

*Effective date:* October 26, 1976. The effective date of this standard is established as 9 months after the date of its issuance, as required by the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492, section 202 (15 U.S.C. 1397(i)(1)(A)).

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); § 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50).

Issued on January 22, 1976.

Howard J. Dugoff  
Acting Administrator

41 F.R. 4016  
January 28, 1976



# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222**

## **School Bus Seating and Crash Protection**

**(Docket No. 73-3; Notice 6)**

This notice responds to two petitions for reconsideration of Standard No. 222, *School Bus Passenger Seating and Crash Protection*, as it was issued January 22, 1976.

Standard No. 222 (49 CFR 571.222) was issued January 22, 1976 (41 F.R. 4016, January 28, 1976), in accordance with § 202 of the Motor Vehicle and Schoolbus Safety Amendments of 1974, Pub. L. 93-492 (15 U.S.C. § 1392(i)(1)) and goes into effect on October 26, 1976. The standard provides for compartmentalization of bus passengers between well-padded and well-constructed seats in the event of collision. Petitions for reconsideration of the standard were received from Sheller-Globe Corporation and from the Physicians for Automotive Safety (PAS), which also represented the views of Action for Child Transportation Safety, several adult individuals, and several school bus riders.

PAS expressed dissatisfaction with several aspects of the standard. The organization objected most strongly to the agency's decision that seat belts should not be mandated in school buses. PAS disagreed with the agency conclusion (39 F.R. 27585, July 30, 1974) that, whatever the potential benefits of safety belts in motor vehicle collisions, the possibility of their non-use or misuse in the hands of children makes them impractical in school buses without adequate supervision. In support of safety belt installation, PAS cited statistics indicating that 23 percent of reported school bus accidents involve a side impact or rollover of the bus.

While safety belts presumably would be beneficial in these situations, PAS failed to provide evidence that the belts, if provided, would be properly utilized by school-age children. The agency will continue to evaluate the wisdom of

its decision not to mandate belts, based on any evidence showing that significant numbers of school districts intend to provide the supervision that should accompany belt use. In view of the absence of evidence to date, however, the agency maintains its position that requiring the installation of safety belts on school bus passenger seats is not appropriate and denies the PAS petition for reconsideration. The agency continues to consider the reduced hostility of improved seating to be the best reasonable form of protection against injury.

PAS asked that a separate standard for seat belt assembly anchorages be issued. They disagree with the agency's conclusion (41 F.R. 4016) that seat belt anchorages should not be required because of indications that only a small fraction of school buses would have belts installed and properly used. However, PAS failed to produce evidence that a substantial number of school buses would be equipped with safety belts, or that steps would be taken to assure the proper use of such belts. In the absence of such information, the agency maintains its position that a seat belt anchorage requirement should not be included in the standard at this time, and denies the PAS petition for reconsideration.

The NHTSA does find merit in the PAS concern that in the absence of additional guidance, improper safety belt installation may occur. The Administration is considering rulemaking to establish performance requirements for safety belt anchorages and assemblies when such systems are installed on school bus passenger seats.

PAS also requested that the seat back height be raised from the 20-inch level specified by the standard to a 24-inch level. In support of this position, the organization set forth a "common



sense" argument that whiplash must be occurring to school bus passengers in rear impact. However, the agency has not been able to locate any quantified evidence that there is a significant whiplash problem in school buses. The crash forces imparted to a school bus occupant in rear impact are typically far lower than those imparted in a car-to-car impact because of the greater weight of the school bus. The new and higher seating required by the standard specifies energy absorption characteristics for the seat back under rear-impact conditions, and the agency considers that these improvements over earlier seating designs will reduce the number of injuries that occur in rear impact. For lack of evidence of a significant whiplash problem, the PAS petition for a 24-inch seat back is denied.

PAS believed that the States and localities that specify a 24-inch seat back height would be precluded from doing so in the future by the preemptive effect of Standard No. 222 under § 103(f) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1392(f)):

§ 103 \* \* \* \* \*

(d) Whenever a Federal motor vehicle safety standard under this subchapter is in effect, no State or political subdivision of a State shall have any authority either to establish, or to continue in effect, with respect to any motor vehicle or item of motor vehicle equipment any safety standard applicable to the same aspect of performance of such vehicle or item of equipment which is not identical to the Federal standard. Nothing in this section shall be construed to prevent the Federal Government or the government of any State or political subdivision thereof from establishing a safety requirement applicable to motor vehicle equipment procured for its own use if such requirement imposes a higher standard of performance than that required to comply with the otherwise applicable Federal standard.

Standard No. 222 specifies a minimum seat back height (S5.1.2) which manufacturers may exceed as long as their product conforms to all other requirements of the standards applicable to school buses. It is the NHTSA's opinion that any State standard of general applicability concerning seat back height of school bus seating

would also have to specify a minimum height identical to the Federal requirement. Manufacturers would not be required to exceed this minimum. Thus, the PAS petition to state seat back height as a minimum is unnecessary and has already been satisfied, although it does not have the effect desired by the PAS.

With regard to the PAS concern that the States' seat height requirements would be preempted, the second sentence of § 103(d) clarifies that the limitation on safety regulations of general applicability does not prevent governmental entities from specifying additional safety features in vehicles purchased for their own use. Thus, a State or its political subdivisions could specify a seat back height higher than 20 inches in the case of public school buses. The second sentence does not permit these governmental entities to specify safety features that prevent the vehicle or equipment from complying with applicable safety standards.

With regard to which school buses qualify as "public school buses" that may be fitted with additional features, it is noted that the agency includes in this category those buses that are owned and operated by a private contractor under contract with a State to provide transportation for students to and from public schools.

Sheller-Globe Corporation (Sheller) petitioned for exclusion from the seating requirements for seating that is designed for handicapped or convalescent students who are unable to utilize conventional forward-facing seats. Typically, side-facing seats are installed to improve entry and egress since knee room is limited in forward-facing seats, or spaces on the bus are specifically designed to accommodate wheelchairs. The standard presently requires that bus passenger seating be forward-facing (S5.1) and conform to requirements appropriate for forward-facing seats. Blue Bird Body Company noted in a March 29, 1976, letter that it also considered the standard's requirements inappropriate for special seating.

The agency has considered the limited circumstances in which this seating would be offered in school buses and concludes that the seat-spacing requirement (S5.2) and the fore-and-aft seat performance requirements (S5.1.3, S5.1.4) are not

appropriate for side-facing seats designed solely for handicapped or convalescent students. Occupant crash protection is, of course, as important for these students as others, and the agency intends to establish requirements suited to these specialized seating arrangements. At this time, however, insufficient time remains before the effective date of this standard to establish different requirements for the seating involved. Therefore, the NHTSA has decided to modify its rule by the exclusion of side-facing seating installed to accommodate handicapped or convalescent passengers.

School bus manufacturers should note that the limited exclusion does not relieve them from providing a restraining barrier in front of any forward-facing seat that has a side-facing seat or wheelchair position in front of it.

Sheller also petitioned for a modification of the head protection zone (S5.3.1.1) that describes the space in front of a seating position where an occupant's head would impact in a crash. The outer edge of this zone is described as a vertical longitudinal plane 3.25 inches inboard of the outboard edge of the seat.

Sheller pointed out that van-type school buses utilize "tumble home" in the side of the vehicle that brings the bus body side panels and glazing into the head protection zone. As Sheller noted, the agency has never intended to include body side panels and glazing in the protection zone. The roof structure and overhead projections from the interior are included in this area of the zone. To clarify this distinction and account for the "tumble home," the description of the head impact zone in S5.3.1.1 is appropriately modified.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 F.R. 16201; April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The decision to withdraw requirements for side-facing seats used by handicapped or convalescent students will result in cost savings to manufacturers and pur-

chasers. The action may encourage production of specialized buses that would otherwise not be built if the seating were subject to the standard. Because the requirements are not appropriate to the orientation of this seating, it is estimated that no significant loss of safety benefits will occur as a result of the amendment. The exclusion of sidewall, window or door structure from the head protection zone is simply a clarification of the agency's longstanding intent that these components not be subject to the requirements. Therefore no new consequences are anticipated as a result of this amendment.

In an area unrelated to the petitions for reconsideration, the Automobile Club of Southern California petitioned for specification of a vandalism resistance specification for the upholstery that is installed in school buses in compliance with Standard No. 222. Data were submitted on experience with crash pads installed in school buses operated in California. Vandalism damage was experienced, and its cost quantified in the submitted data.

The Automobile Club made no argument that the damage to the upholstery presents a significant safety problem. While it is conceivable that removal of all padding from a seat back could occur and expose the rigid seat frame, the agency estimates that this would occur rarely and presumably would result in replacement of the seat. Because the agency's authority under the National Traffic and Motor Vehicle Safety Act is limited to the issuance of standards that meet the need for motor vehicle safety (15 U.S.C. § 1392(a)), the agency concludes that a vandalism resistance requirement is not appropriate for inclusion in Standard No. 222.

In light of the foregoing, Standard No. 222 (49 CFR 571.222) is amended. . . .

*Effective date:* October 26, 1976. Because the standard becomes effective on October 26, 1976, it is found to be in the public interest that an effective date sooner than 180 days is in the public interest. Changes in the text of the Code of Federal Regulations should be made immediately.

**Effective: October 26, 1976**

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on July 7, 1976.

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James B. Gregory  
Administrator

**41 F.R. 28506**  
**July 12, 1976**



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222

## School Bus Seating and Crash Protection

(Docket No. 73-3; Notice 8)

This notice amends Standard No. 222, *School Bus Passenger Seating and Crash Protection*, to delay the effective date for maximum rearward deflection of seats from April 1, 1977, to April 1, 1978.

Standard No. 222 (49 CFR 571.222), as published January 28, 1976 (41 F.R. 4016), established October 27, 1976, as the effective date of the standard, as mandated by the Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) (Pub. L. 93-492). Congress subsequently amended the Act by Public Law 94-346 (July 8, 1976) to extend the effective date for the implementation of school bus standards to April 1, 1977.

The NHTSA has promulgated regulations on several aspects of performance mandated by Congress in the Act. These regulations become effective on April 1, 1977. The agency concludes, however, that compliance with one provision of Standard No. 222 by the April 1, 1977, effective date would be impracticable, would result in substantial economic waste, and would not be in the public interest.

Since publication of Standard No. 222, a misunderstanding has arisen within the industry concerning the definition of the term "absorbed" when used in connection with the requirements in sections S5.1.3.4 and S5.1.4.2. The NHTSA explained the term "absorbed" in an interpretation to Thomas Built Buses (July 30, 1976) to mean "receive without recoil." This interpretation requires that returned energy be subtracted from total energy applied to the seat back to calculate energy "absorbed" by the seat back.

School bus manufacturers tested their seats in accordance with the NHTSA definition of "absorbed" and found that the seats continued to

comply with the requirements of Standard No. 222 when tested for forward performance (S5.1.3), but these same seats were marginally below the NHTSA requirements for rearward seat deflection. Based upon these test data, petitions have been received from Thomas Built Buses, Blue Bird Body Company, Carpenter Body Works, Wayne Corporation, and Ward School Bus Manufacturing, all requesting a change in rearward performance requirements.

The NHTSA has examined the data submitted by the manufacturers and concludes that the seats upon which the tests were made demonstrate a high probability of meeting most of the requirements of Standard No. 222. Further, the agency concludes that to mandate full compliance with the rearward performance requirements of Standard No. 222 would require extensive retooling and redesign. This could result in substantial economic waste of seats now in production and severe economic hardship for manufacturers.

The NHTSA is particularly concerned that to require full compliance with the rearward performance requirements at this late date might mean that manufacturers would be unable to redesign their seats in time to commence manufacture of completed buses on April 1, 1977. Since single-stage buses produced after April 1, 1977, must meet NHTSA safety requirements in all other respects, they will be substantially safer than buses currently in use. Therefore, the agency finds that it is in the interest of safety to ensure that these safer buses will be available on April 1, 1977, to replace older less safe models. To ensure that safer buses can be marketed without delay, the NHTSA extends the effective date of requirements for maximum rearward deflection of seats to April 1, 1978. It is emphasized

that the numerous other requirements for school bus seating, including all other rearward performance requirements, remain in effect, which ensures adequate interior protection as of April 1, 1977, as mandated by Congress. A proposal for minor modification of S5.1.4 (to be published shortly) will permit reinstitution of rearward deflection requirements following the 1-year delay.

Because of the imminent effective date of the school bus safety standards and the lead time required to modify seat design, the NHTSA for good cause finds that notice and public procedure on this amendment are impracticable and contrary to the public interest.

In consideration of the foregoing, S5.1.4(b) of Standard No. 222 (49 CFR 571.222) is amended by the addition, at the beginning of the first sentence, of the following phrase: "In the

case of a school bus manufactured on or after April 1, 1978,".

*Effective date:* December 16, 1976. Because this amendment relieves a restriction and does not impose requirements on any person, it is found, for good cause shown, that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on December 10, 1976.

Acting Administrator  
Charles E. Duke

**41 F.R. 54945**  
**December 16, 1976**

# **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222**

**(Docket No. 73-3; Notice 12)**

This notice amends Standard No. 222, *School Bus Passenger Seating and Crash Protection*, increasing the allowable rearward deflection of seats from 8 to 10 inches. The action is taken in response to petitions that indicated the current rearward deflection requirement is unnecessarily restrictive in that it would require costly retooling of school bus seats with no measurable safety advantage over a somewhat greater deflection distance that would not entail significant retooling. Additionally, a minor modification of the standard is made clarifying the meaning of "absorbed energy" consistent with an agency interpretation of that term.

Effective Date: April 1, 1978.

For further information contact:

Mr. Timothy Hoyt, Crashworthiness Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264).

Supplementary Information: On November 10, 1977, the NHTSA published a notice proposing to amend the rearward deflection requirement of Standard No. 222, *School Bus Passenger Seating and Crash Protection*. The impetus for that proposal came from several petitions from school bus manufacturers claiming that the rearward deflection requirement was unnecessarily restrictive since it would require significant retooling of school bus seats which would not be measurably superior, in terms of safety, to seats designed to meet a slightly greater deflection distance. They stated that seats produced in compliance with a somewhat greater rearward deflection requirement, as opposed to the currently specified 8-inch requirement, would not require retooling. The NHTSA agreed with the petitioners and, accordingly, proposed to increase the allowable rearward deflection of seats from 8 to 10 inches. By

the same notice, the NHTSA proposed a minor modification of the standard clarifying the agency's meaning of absorbed energy.

Only one comment was received in response to that notice of proposed rulemaking. The Vehicle Equipment Safety Commission did not submit comments.

The only commenter, Blue Bird Body Company, took issue with the agency's proposed method for limiting rearward seat deflection. It asserted that the requirement expressed in S5.1.4 (c) of the standard should be the only limitation on rearward seat deflection. That section provides that a seat shall not, when tested, come within 4 inches of any portion of another passenger seat.

Blue Bird's comment is not persuasive. The requirement of S5.1.4(c) addresses an entirely separate safety concern than the requirement of S5.1.4(b). Section S5.1.4(b) limits the rearward deflection of a seat, by this notice, to a maximum of 10 inches. That requirement functions as part of the compartmentalization scheme of Standard 222. Limiting the degree of seat back deflection helps to contain a child within the seat structures in the event of an accident. This requirement should be distinguished from that contained in S5.1.4(c), which is intended to ensure that a minimum amount of space remains between seats following an accident so that a child does not become trapped. Since both requirements are necessary to maintain the safety level considered necessary for school buses, Blue Bird's request is denied.

Blue Bird stated in its comments a preference for specifying maximum rearward seat deflection in terms of inches rather than angle. This comment suggests that Blue Bird misinterpreted the statements in the notice of proposed rulemaking as indicating that the NHTSA was contemplat-



Effective: April 1, 1978

ing an amendment that would limit the angle of seat deflection. The reference in the notice to a 40° seat angle was made only to justify the proposed 10-inch maximum seat deflection. A 40° seat angle roughly translates to 10 inches of rearward seat deflection. There was no intention to suggest that an angle limitation was under consideration. In fact, the preamble stated that the NHTSA had abandoned, in earlier rulemaking, attempts to adopt an angular measurement owing to the difficulty of making such a measurement.

The agency concludes that the extension of the allowable rearward deflection of seats from 8 to 10 inches assures passenger safety while minimizing the cost impact of compliance with the school bus regulations. Since this amendment relieves a restriction, it should result in no increase in costs.

In consideration of the foregoing, Part 571, of Title 49, CFR, is amended. . . .

The principal authors of this proposal are Timothy Hoyt of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 203, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegation of authority at 49 CFR 1.50.)

Issued on March 1, 1978.

Joan Claybrook  
Administrator

**43 F.R. 9149**  
**March 6, 1976**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 222

### School Bus Seating and Crash Protection

(Docket No. 73-3; Notice 13)

*Action:* Final rule.

*Summary:* This notice makes final an existing interim amendment to Standard No. 222, *School Bus Seating and Crash Protection*, increasing the maximum allowable seat spacing in school buses from 20 to 21 inches. In issuing the original standard, the agency intended that the seats be spaced approximately 20 inches apart (S5.2). However, because of manufacturing tolerances, some school bus manufacturers were spacing their seats at distances less than 20 inches to ensure that the spacing does not exceed the prescribed maximum. A seat spacing specification of 21 inches permits 20-inch spacing of seats by taking manufacturing tolerances into fuller account. This spacing will accommodate large high school students while still ensuring a safe level of school bus seat performance.

*Effective date:* Since this amendment merely makes final an existing interim rule, it is effective March 29, 1979.

*For further information contact:*

Mr. Robert Williams, Crashworthiness Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-2264.

*Supplementary information:* On December 22, 1977, the National Highway Traffic Safety Administration issued a proposal to increase the allowable seat spacing in school buses from 20 to 21 inches (42 FR 64136). Concurrently with that proposal, the NHTSA issued an interim final rule permitting buses to be constructed immediately with the increased seat spacing (42 FR 64119). This action was taken to provide the amount of seat spacing in school buses originally intended

by the agency and to relieve immediately problems created by the unnecessarily limited seat spacing in buses then being built. The action resulted from numerous complaints by school bus users relating to seat spacing. The proposal and interim final rule responded to petitions from the Wisconsin School Bus Association and the National School Transportation Association asking for increased seat spacing.

The agency received many comments in response to its December 1977 proposal. Most comments favored some extension in the seat spacing allowance in school buses. Commenters differed as to the amount of seat spacing needed to accommodate fully the larger school children. Some commenters suggested that the agency provide still more seat spacing than proposed in the December 22 notice. Other commenters supported the agency's suggested modification.

The agency has reviewed all of the comments and the petitions concerning this issue and has concluded that the proposal and interim rule provide sufficient seat spacing in school buses for all school children. To provide greater seat spacing, as suggested by some commenters, might necessitate changing the seat structures to absorb more energy. See the December proposal for further discussion of this point. The NHTSA does not believe that such a costly change is warranted at this time. The agency notes that as a result of the interim rule seat spacing in buses has become adequate to meet the needs for pupil transportation to and from school. The agency continues, however, to research the proper seating for activity buses and will address that issue in a separate notice as soon as all of the research and analysis is completed.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations, Part 571, Standard No. 222, *School Bus Seating and Crash Protection*, is amended . . . .

The principal authors of this notice are Robert Williams of the Crashworthiness Division and Roger Tilton of the Office of Chief Counsel.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407) ; Sec. 203, Pub. L. 93-492,

88 Stat. 1470 (15 U.S.C. 1392) ; delegation of authority at 49 CFR 1.50.)

Issued on March 21, 1979.

Joan Claybrook  
Administrator

**44 F.R. 18674-18675**  
**March 29, 1979**



## MOTOR VEHICLE SAFETY STANDARD NO. 222

### School Bus Seating and Crash Protection

**S1. Scope.** This standard establishes occupant protection requirements for school bus passenger seating and restraining barriers.

**S2. Purpose.** The purpose of this standard is to reduce the number of deaths and the severity of injuries that result from the impact of school bus occupants against structures within the vehicle during crashes and sudden driving maneuvers.

**S3. Application.** This standard applies to school buses.

**S4. Definitions.** "Contactable surface" means any surface within the zone specified in S5.3.1.1 that is contactable from any direction by the test device described in S6.6, except any surface on the front of a seat back or restraining barrier 3 inches or more below the top of the seat back or restraining barrier.

"School bus passenger seat" means a seat in a school bus, other than the driver's seat or a seat installed to accommodate handicapped or convalescent passengers as evidenced by orientation of the seat in a direction that is more than 45 degrees to the left or right of the longitudinal centerline of the vehicle.

**S4.1** The number of seating positions considered to be in a bench seat is expressed by the symbol W, and calculated as the bench width in inches divided by 15 and rounded to the nearest whole number.

**S5. Requirements.** (a) Each vehicle with a gross vehicle weight rating of more than 10,000 pounds shall be capable of meeting any of the requirements set forth under this heading when tested under the conditions of S6. However, a particular school bus passenger seat (i.e., test

specimen) in that weight class need not meet further requirements after having met S5.1.2 and S5.1.5, or having been subjected to either S5.1.3, S5.1.4, or S5.3.

(b) Each vehicle with a gross vehicle weight rating of 10,000 pounds or less shall be capable of meeting the following requirements at all seating positions other than the driver's seat: (1) The requirements of §§ 571.208, 571.209, and 571.210 (Standard Nos. 208, 209, and 210) as they apply to multipurpose passenger vehicles; and (2) the requirements of S5.1.2, S5.1.3, S5.1.4, S5.1.5, and S5.3 of this standard. However, the requirements of Standard Nos. 208 and 210 shall be met at W seating positions in a bench seat using a body block as specified in Figure 2 of this standard, and a particular school bus passenger seat (i.e., a test specimen) in that weight class need not meet further requirements after having met S5.1.2 and S5.1.5, or having been subjected to either S5.1.3, S5.1.4, S5.3, or § 571.210 (Standard No. 210).

**S5.1 Seating requirements.** School bus passenger seats shall be forward facing.

**S5.1.1** [Reserved]

**S5.1.2 Seat back height and surface area.** Each school bus passenger seat shall be equipped with a seat back that, in the front projected view, has a front surface area above the horizontal plane that passes through the seating reference point, and below the horizontal plane 20 inches above the seating reference point, of not less than 90 percent of the seat bench width in inches multiplied by 20.

**S5.1.3 Seat performance forward.** When a school bus passenger seat that has another seat behind it is subjected to the application of force as specified in S5.1.3.1 and S5.1.3.2, and subse-

quently, the application of additional force to the seat back as specified in S5.1.3.3 and S5.1.3.4:

(a) The seat-back force/deflection curve shall fall within the zone specified in Figure 1;

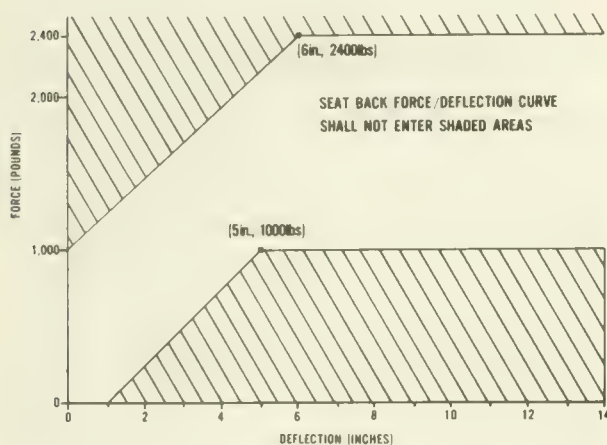


FIGURE 1 FORCE/DEFLECTION ZONE

(b) Seat back deflection shall not exceed 14 inches; (for determination of (a) and (b) the force/deflection curve describes only the force applied through the upper loading bar, and only the forward travel of the pivot attachment point of the upper loading bar, measured from the point at which the initial application of 10 pounds of force is attained.)

(c) The seat shall not deflect by an amount such that any part of the seat moves to within 4 inches of any part of another school bus passenger seat or restraining barrier in its originally installed position;

(d) The seat shall not separate from the vehicle at any attachment point; and

(d) Seat components shall not separate at any attachment point.

**S5.1.3.1** Position the loading bar specified in S6.5 so that it is laterally centered behind the seat back with the bar's longitudinal axis in a transverse plane of the vehicle and in any horizontal plane between 4 inches above and 4 inches below the seating reference point of the school bus passenger seat behind the test specimen.

**S5.1.3.2** Apply a force of 700W pounds horizontally in the forward direction through the loading bar at the pivot attachment point. Reach the specified load in not less than 5 nor more than 30 seconds.

**S5.1.3.3** No sooner than 1.0 second after attaining the required force, reduce that force to 350W pounds and, while maintaining the pivot point position of the first loading bar at the position where the 350W pounds is attained, position a second loading bar described in S6.5 so that it is laterally centered behind the seat back with the bar's longitudinal axis in a transverse plane of the vehicle and in the horizontal plane 16 inches above the seating reference point of the school bus passenger seat behind the test specimen, and move the bar forward against the seat back until a force of 10 pounds has been applied.

**S5.1.3.4** Apply additional force horizontally in the forward direction through the upper bar until 4,000W inch-pounds of energy have been absorbed in deflecting the seat back (or restraining barrier). Apply the additional load in not less than 5 seconds nor more than 30 seconds. Maintain the pivot attachment point in the maximum forward travel position for not less than 5 seconds nor more than 10 seconds and release the load in not less than 5 nor more than 30 seconds. (For the determination of S5.1.3.4 the force/deflection curve describes only the force applied through the upper loading bar, and the forward and rearward travel distance of the upper loading bar pivot attachment point measured from the position at which the initial application of 10 pounds of force is attained.)

**S5.1.4 Seat performance rearward.** When a school bus passenger seat that has another seat behind it is subjected to the application of force as specified in S5.1.4.1 and S5.1.4.2:

(a) Seat back force shall not exceed 2,200 pounds;

(b) In the case of a school bus manufactured on or after April 1, 1978, seat back deflection shall not exceed 10 inches; (For determination of (a) and (b) the force/deflection curve describes only the force applied through the loading bar, and only the rearward travel of the pivot attachment point of the loading bar, measured from the point at which the initial application of 50 pounds of force is attained.)



(c) The seat shall not deflect by an amount such that any part of the seat moves to within 4 inches of any part of another passenger seat in its originally installed position;

(d) The seat shall not separate from the vehicle at any attachment point; and

(e) Seat components shall not separate at any attachment point.

**S5.1.4.1** Position the loading bar described in S6.5 so that it is laterally centered forward of the seat back with the bar's longitudinal axis in a transverse plane of the vehicle and in the horizontal plane 13.5 inches above the seating reference point of the test specimen, and move the loading bar rearward against the seat back until a force of 50 pounds has been applied.

**S5.1.4.2** Apply additional force horizontally rearward through the loading bar until 2,800W inch-pounds of energy have been absorbed in deflecting the seat back. Apply the additional load in not less than 5 seconds nor more than 30 seconds. Maintain the pivot attachment point in the maximum rearward travel position for not less than 5 seconds nor more than 10 seconds and release the load in not less than 5 seconds nor more than 30 seconds. (For determination of S5.1.4.2 the force/deflection curve describes the force applied through the loading bar and the rearward and forward travel distance of the loading bar pivot attachment point measured from the position at which the initial application of 50 pounds of force is attained.)

**S5.1.5 Seat cushion retention.** In the case of school bus passenger seats equipped with seat cushions, with all manual attachment devices between the seat and the seat cushion in the manufacturer's designed position for attachment, the seat cushion shall not separate from the seat at any attachment point when subjected to an upward force of five times the seat cushion weight, applied in any period of not less than 1 nor more than 5 seconds, and maintained for 5 seconds.

**S5.2 Restraining barrier requirements.** Each vehicle shall be equipped with a restraining barrier forward of any designated seating position that does not have the rear surface of another

school bus passenger seat within 20 inches of its seating reference point, measured along a horizontal longitudinal line through the seating reference point in the forward direction.

**S5.2.1 Barrier-seat separation.** The horizontal distance between the restraining barrier's rear surface and the seating reference point of the seat in front of which it is required shall be not more than 20 inches, measured along a horizontal longitudinal line through the seating reference point in the forward direction.

**S5.2.2 Barrier position and rear surface area.** The position and rear surface area of the restraining barrier shall be such that, in a front projected view of the bus, each point of the barrier's perimeter coincides with or lies outside of the perimeter of the seat back of the seat for which it is required.

**S5.2.3 Barrier performance forward.** When force is applied to the restraining barrier in the same manner as specified in S5.1.3.1 through S5.1.3.4 for seating performance tests:

(a) The restraining barrier force/deflection curve shall fall within the zone specified in Figure 1;

(b) Restraining barrier deflection shall not exceed 14 inches; (For computation of (a) and (b) the force/deflection curve describes only the force applied through the upper loading bar, and only the forward travel of the pivot attachment point of the loading bar, measured from the point at which the initial application of 10 pounds of force is attained.)

(c) Restraining barrier deflection shall not interfere with normal door operation;

(d) The restraining barrier shall not separate from the vehicle at any attachment point; and

(e) Restraining barrier components shall not separate at any attachment point.

### **S5.3 Impact zone requirements.**

**S5.3.1 Head protection zone.** Any contactable surface of the vehicle within any zone specified in S5.3.1.1 shall meet the requirements of S5.3.1.2 and S5.3.1.3. However, a surface area that has been contacted pursuant to an impact test need not meet further requirements contained in S5.3.



**S5.3.1.1** The head protection zones in each vehicle are the spaces in front of each school bus passenger seat which are not occupied by bus sidewall, window, or door structure and which, in relation to that seat and its seating reference point, are enclosed by the following planes;

- (a) Horizontal planes 12 inches and 40 inches above the seating reference point;
- (b) A vertical longitudinal plane tangent to the inboard (aisle side) edge of the seat;
- (c) A vertical longitudinal plane 3.25 inches inboard of the outboard edge of the seat, and
- (d) Vertical transverse planes through and 30 inches forward of the reference point.

**S5.3.1.2 Head form impact requirement.** When any contactable surface of the vehicle within

the zones specified in S5.3.1.1 is impacted from any direction at 22 feet per second by the head form described in S6.6, the axial acceleration at the center of gravity of the head form shall be such that the expression

shall not exceed 1,000 where  $a$  is the axial acceleration expressed as a multiple of  $g$  (the acceleration due to gravity), and  $t_1$  and  $t_2$  are any two points in time during the impact.

**S5.3.1.3 Head form force distribution.** When any contactable surface of the vehicle within the zones specified in S5.3.1.1 is impacted from any direction at 22 feet per second by the head form

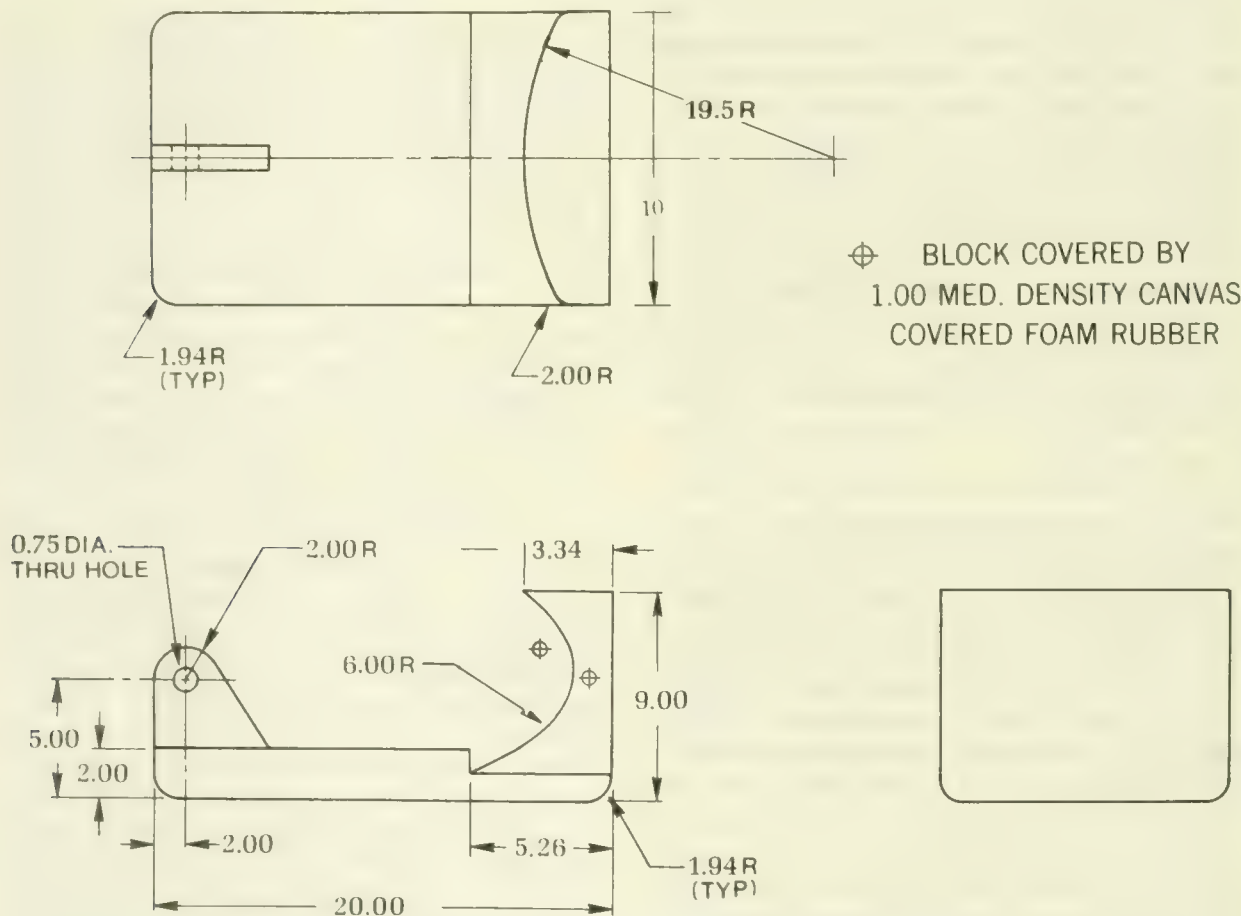


FIGURE 2 – BODY BLOCK FOR LAP BELT

described in S6.6, the energy necessary to deflect the impacted material shall be not less than 40 inch-pounds before the force level on the head form exceeds 150 pounds. When any contactable surface within such zones is impacted by the head form from any direction at 5 feet per second, the contact area on the head form surface shall be not less than 3 square inches.

**S5.3.2 Leg protection zone.** Any part of the seat backs or restraining barriers in the vehicle within any zone specified in S5.3.2.1 shall meet the requirements of S5.3.2.2.

**S5.3.2.1.** The leg protection zones of each vehicle are those parts of the school bus passenger seat backs and restraining barriers bounded by horizontal planes 12 inches above and 4 inches below the seating reference point of the school bus passenger seat immediately behind the seat back or restraining barrier.

**S5.3.2.2.** When any point on the rear surface of that part of a seat back or restraining barrier within any zone specified in S5.3.2.1 is impacted from any direction at 16 feet per second by the knee form specified in S6.7, the resisting force of the impacted material shall not exceed 600 pounds and the contact area on the knee form surface shall not be less than 3 square inches.

**S6. Test conditions.** The following conditions apply to the requirements specified in S5.

**S6.1 Test surface.** The bus is at rest on a level surface.

**S6.2 Tires.** Tires are inflated to the pressure specified by the manufacturer for the gross vehicle weight rating.

**6.3 Temperature.** The ambient temperature is any level between 32 degrees F. and 90 degrees F.

**S6.4 Seat back position.** If adjustable, a seat back is adjusted to its most upright position.

**S6.5 Loading bar.** The loading bar is a rigid cylinder with an outside diameter of 6 inches that has hemispherical ends with radii of 3 inches and with a surface roughness that does not exceed 63 micro-inches, root mean square. Then length of the loading bar is 4 inches less than the

width of the seat back in each test. The stroking mechanism applies force through a pivot attachment at the centerpoint of the loading bar which allows the loading bar to rotate in a horizontal plane 30 degrees in either direction from the transverse position.

**S6.5.1** A vertical or lateral force of 4,000 pounds applied externally through the pivot attachment point of the loading bar at any position reached during a test specified in this standard shall not deflect that point more than 1 inch.

**S6.6 Head form.** The head form for the measurement of acceleration is a rigid surface comprised of two hemispherical shapes, with total equivalent weight of 11.5 pounds. The first of the two hemispherical shapes has a diameter of 6.5 inches. The second of the two hemispherical shapes has a 2 inch diameter and is centered as shown in Figure 3 to protrude from the outer surface of the first hemispherical shape. The surface roughness of the hemispherical shapes does not exceed 63 micro-inches, root mean square.

**S6.6.1** The direction of travel of the head form is coincidental with the straight line connecting the centerpoints of the two spherical outer surfaces which constitute the head form shape.

**S6.6.2** The head form is instrumented with an acceleration sensing device whose output is recorded in a data channel that conforms to the requirements for a 1,000 Hz channel class as specified in SAE Recommended Practice J211a, December 1971. The head form exhibits no resonant frequency below three times the frequency of the channel class. The axis of the acceleration sensing device coincides with the straight line connecting the centerpoints of the two hemispherical outer surfaces which constitute the head form shape.

**S6.6.3** The head form is guided by a stroking device so that the direction of travel of the head form is not affected by impact with the surface being tested at the levels called for in the standard.

## BIHEMISPHERICAL HEAD FORM RADII

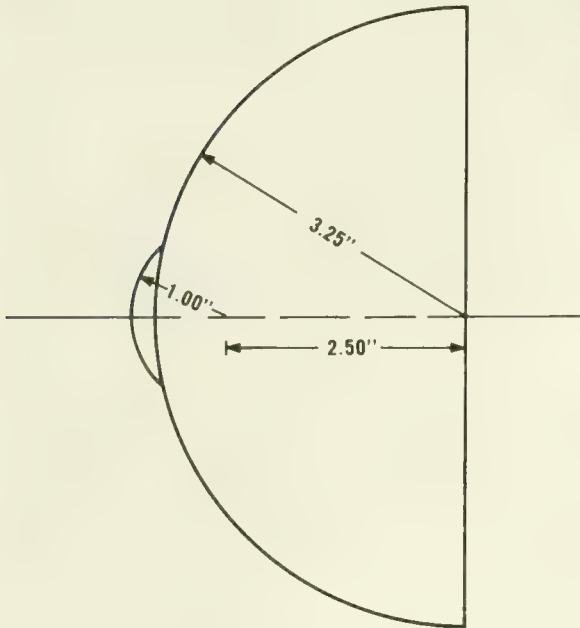


FIGURE 3

**S6.7 Knee form.** The knee form for measurement of force is a rigid 3-inch-diameter cylinder, with an equivalent weight of 10 pounds, that has one rigid hemispherical end with a 1½ inch

radius forming the contact surface of the knee form. The hemispherical surface roughness does not exceed 63 micro-inches, root mean square.

**S6.7.1** The direction of travel of the knee form is coincidental with the centerline of the rigid cylinder.

**S6.7.2** The knee form is instrumented with an acceleration sensing device whose output is recorded in a data channel that conforms to the requirements of a 600 Hz channel class as specified in the SAE Recommended Practice J211a, December 1971. The knee form exhibits no resonant frequency below three times the frequency of the channel class. The axis of the acceleration sensing device is aligned to measure acceleration along the centerline of the cylindrical knee form.

**S6.7.3** The knee form is guided by a stroking device so that the direction of travel of the knee form is not affected by impact with the surface being tested at the levels called for in the standard.

**S6.8** The head form, knee form, and contactable surfaces are clean and dry during impact testing.

41 F.R. 4016  
January 28, 1976



## MOTOR VEHICLE SAFETY STANDARD NO. 301

### Fuel Tanks, Fuel Tank Filler Pipes, and Fuel Tank Connections—Passenger Cars

**S1. Purpose and scope.** This standard specifies requirements for the integrity and security of fuel tanks, fuel tank filler pipes, and fuel tank connections to minimize fire hazard as a result of collision.

**S2. Application.** This standard applies to passenger cars.

**S3. Requirements.** When tested in accordance with S4:

(a) Fuel tank filler pipes, fuel tank connections to fuel lines, and fuel tanks filled to at least 90 percent of capacity with a liquid having substantially the same viscosity as, and specific

gravity no less than, the fuel used in the vehicle, shall not discharge fluid at a rate greater than 1 ounce (by weight) per minute after termination of impact.

(b) Fluid losses during impact shall not exceed 1 ounce (by weight)

**S4. Demonstration procedures.** Impact the vehicle perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

32 F.R. 2416  
February 3, 1967



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY  
STANDARD NO. 301(9/1/75)**

**Fuel System Integrity**

(Docket No. 70-20; Notice 2)

This notice amends Motor Vehicle Safety Standard No. 301 on fuel system integrity to specify static rollover requirements applicable to passenger cars on September 1, 1975, and to extend applicability of the standard to multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less on September 1, 1976.

The NHTSA proposed amending 49 CFR 571.301, *Fuel Tanks, Fuel Tank Filler Pipes, and Fuel Tank Connections*, on August 29, 1970, (35 F.R. 13799). Under the proposal the standard would be extended to all vehicles with a GVWR of 10,000 pounds or less. No fuel spillage would be permitted during the standard's tests. As proposed, these would include a spike stop from 60 mph, and a 30 mph frontal barrier crash. Additional tests for vehicles with a GVWR of 6,000 pounds or less would include a rear-end collision with a fixed barrier at 30 mph, and a static rollover test following the frontal barrier crash. With respect to the proposal: the frontal impact and static rollover tests are adopted but with an allowance of fuel spillage of 1 ounce per minute; the spike stop test is not adopted; and the rear-end fixed barrier collision test is being repropose in a separate rule making action published today to substitute a moving barrier.

The proposal that there be zero fuel spillage was almost universally opposed for cost/benefit reasons. The NHTSA has concluded that the requirement adopted, limiting fuel spillage to 1 ounce per minute, will have much the same effect as a zero-loss requirement. The standard will effectively require motor vehicles to be designed for complete fuel containment, since any spillage allowed by design in the aftermath of

testing could well exceed the limit of the standard. At the same time, the 1-ounce allowance would eliminate concern over a few drops of spillage that in a functioning system may be unavoidable.

Fuel loss will be measured for a 15-minute period for both impact and rollover tests.

The NHTSA proposed a panic-braking stop from 60 mph to demonstrate fuel system integrity. Many commented that this appeared superfluous, increasing testing costs with no performance improvements, since the proposed front and rear impact tests represented considerably higher deceleration loadings than could be achieved in braking. The NHTSA concurs, and has not adopted the panic stop test. The frontal barrier crash at 30 mph has been retained for passenger cars, and extended to multipurpose passenger vehicles, trucks, and buses with a GVWR of 10,000 pounds or less as of September 1, 1976.

The static rollover test was adopted as proposed. It applies to passenger cars as of September 1, 1975, and to multipurpose passenger vehicles, trucks, and buses with a GVWR of 6,000 pounds or less, as of September 1, 1976. The rollover test follows the front barrier crash, and consists of a vehicle being rotated on its longitudinal axis at successive increments of 90°. A condition of the test is that rotation between increments occurs in not less than 1 minute and not more than 3 minutes. After reaching a 90° increment, the vehicle is held in that position for 5 minutes.

The proposed rear-end crash test incorporated a fixed collision barrier. Manufacturers generally favored a moving barrier impact as a closer



Effective: September 1, 1975

simulation of real world conditions. The NHTSA concurs and is not adopting a rear end fixed barrier test. Instead, it is proposing a rear-end moving barrier collision test as part of the notice of proposed rulemaking published today.

Under the proposal the vehicle would be loaded to its GVWR with the fuel tank filled to any level between 90 and 100 percent of capacity. Many commenters objected on the grounds that full loading of a vehicle represents an unrealistic condition in terms of actual crash experience. The NHTSA does not agree. Although full loading of a vehicle is not the condition most frequently encountered, it certainly occurs frequently enough that the vehicle should be designed to give basic protection in that condition. The vehicle test weight condition has been adopted as proposed. It should be noted that, in the parallel notice of proposed rulemaking issued today, vehicles would be tested under the

weight conditions specified in Standard No. 208, effective September 1, 1975.

In consideration of the foregoing, 49 CFR Part 571.301, Motor Vehicle Safety Standard No. 301, is amended . . . .

*Effective date:* September 1, 1975. Because of the necessity to allow manufacturers sufficient production leadtime it is found for good cause shown that an effective date later than 1 year after issuance of this rule is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 15, 1973.

James B. Gregory  
Administrator

**38 F.R. 22397**  
**August 20, 1973**

**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301****Fuel System Integrity****(Docket No. 73-20; Notice 2)**

The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 301, *Fuel System Integrity*, to upgrade substantially the requirements of the standard by specifying a rear moving barrier crash, a lateral moving barrier crash, and a frontal barrier crash including impacts at any angle up to 30° in either direction from the perpendicular.

A notice of proposed rulemaking published August 20, 1973 (38 F.R. 22417) proposed the imposition of additional testing requirements designed to ameliorate the dangers associated with fuel spillage following motor vehicle accidents. In an amendment to Standard No. 301, published on the same day as the proposal, a frontal barrier crash and a static rollover test were specified. In order to ensure the safety of fuel systems in any possible collision situation, the NHTSA finds it essential to incorporate additional proposed test requirements into the present standard and to make these requirements applicable to all vehicle types with a GVWR of 10,000 pounds or less.

Comments in response to the proposal were received from 29 commenters. Any suggestions for changes of the proposal not specifically mentioned herein are denied, on the basis of all the information presently available to this agency. A number of the issues raised in the comments have been dealt with by the agency in its response to the petitions for reconsideration of the final rule issued on August 20, 1973. In its notice responding to the petitions, the NHTSA considered objections to the use of actual fuel during testing, the specified fuel fill level, the application of the standard to vehicles using diesel fuel, the fuel spillage measuring requirement, and the allegedly more stringent loading requirements

applicable to passenger cars. The type of fuel subject to the standard was also clarified.

Objections were registered by 13 commenters to the proposed inclusion of a dynamic rollover test in the fuel system integrity standard. As proposed, the requirement calls for a measurement of the fuel loss while the vehicle is in motion. Commenters pointed out the exceptional difficulty in measuring or even ascertaining a leakage when the vehicle is rolling over at 30 mph. The NHTSA has decided that the objections have merit, and has deleted the dynamic rollover test. The results of the dynamic rollover do not provide sufficiently unique data with regard to the fuel system's integrity to justify the cost of developing techniques for accurately measuring spillage during such a test, and of conducting the test itself. The NHTSA has concluded that the severity of the other required tests, when conducted in the specified sequence, is sufficient to assure the level of fuel system integrity intended by the agency.

Triumph Motors objected to the use of a 4,000-pound barrier during the moving barrier impacts, asserting that such large barriers discriminate against small vehicles. Triumph requested that the weight of the barrier be the curb weight of the vehicle being tested in order to alleviate the burden on small vehicles. The NHTSA has concluded that no justification exists for this change. The moving barrier is intended to represent another vehicle with which the test vehicle must collide. The use of a 4,000-pound moving barrier is entirely reasonable since vehicles in use are often over 4,000 pounds in weight and a small vehicle is as likely to collide with a vehicle of that size as one smaller. The NHTSA considers it important that vehicle fuel systems be

designed in such a way as to withstand impacts from vehicles they are exposed to on the road, regardless of the differences in their sizes.

Jeep and American Motors objected to the effective dates of the proposed requirements and asked that they be extended. Jeep favors an effective date not earlier than September 1, 1979, and American Motors favors a September 1, 1978, effective date. The NHTSA denies these requests. It has found that the time period provided for development of conforming fuel systems is reasonable and should be strictly adhered to considering the urgent need for strong and resilient fuel systems.

Several commenters expressed concern over the impact of the prescribed testing procedures on manufacturers of low-volume specialty vehicles. The NHTSA appreciates the expense of conducting crash tests on low-production vehicles, realizing that the burden on the manufacturer is related to the number of vehicles he manufactures. However, there are means by which the small-volume manufacturer can minimize the costs of testing. He can concentrate test efforts on the vehicle(s) in his line that he finds most difficult to produce in conformity with the standard. These manufacturers should also be aware that an exemption from application of the standard is available where fewer than 10,000 vehicles per year are produced and compliance would subject him to substantial financial hardship.

In responding to the petitions for reconsideration of the amendment to Standard No. 301, published August 20, 1973, the NHTSA revised the fuel system loading requirement to specify Stoddard solvent as the fuel to be used during testing. In accordance with that amendment, the proposed requirement that the engine be idling during the testing sequence is deleted. However, electrically driven fuel pumps that normally run when the electrical system in the vehicle is activated shall be operating during the barrier crash tests.

In order to fulfill the intention expressed in the preamble to the proposal, that simultaneous testing under Standards Nos. 208 and 301 be possible, language has been added to subparagraph S7.1.5 of Standard No. 301 specifying the same method of restraint as that required in

Standard No. 208. In its response to petitions for reconsideration of Standard No. 301 (39 F.R. 10586) the NHTSA amended the standard by requiring that each dummy be restrained during testing only by means that are installed in the vehicle for protection at its seating position and that require no action by the vehicle occupant.

Suggestions by several commenters that the application of certain crash tests should be limited to passenger cars in order to maintain complete conformance to the requirements of Standard No. 208 are found to be without merit. Enabling simultaneous testing under several standards, although desirable, is not the most important objective of the safety standards. The NHTSA is aware of the burden of testing costs, and therefore has sought to ease that burden where possible by structuring certain of its standards to allow concurrent testing for compliance. It must be emphasized, however, that the testing requirements specified in a standard are geared toward a particular safety need. Application of the tests proposed for Standard No. 301 to all vehicle types with a GVWR of 10,000 pounds or less is vital to the accomplishment of the degree of fuel system integrity necessary to protect the occupants of vehicles involved in accidents.

No major objections were raised concerning the proposed angular frontal barrier crash, lateral barrier crash, or rear moving barrier crash. On the basis of all information available to this agency, it has been determined that these proposed crash tests should be adopted as proposed.

In consideration of the foregoing, 49 CFR 571.301, Motor Vehicle Safety Standard No. 301, is amended to read as set forth below.

Effective date: September 1, 1975, with additional requirements effective September 1, 1976, and September 1, 1977, as indicated.

(Secs. 103, 119, Pub. L. 89-562, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on March 18, 1974.

James B. Gregory  
Administrator

39 F.R. 10588  
March 21, 1974



**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75****Fuel System Integrity****(Docket No. 73-20; Notice 3)**

This notice responds to petitions for reconsideration of the two recent Federal Register notices amending and upgrading Standard No. 301 (39 F.R. 10586; 39 F.R. 10588) and amends the standard in several respects.

On March 21, 1974 two notices were published pertaining to Standard No. 301, *Fuel System Integrity*. One notice (39 F.R. 10586) responded to petitions for reconsideration of an earlier amendment to the standard (38 F.R. 22397), while the other (39 F.R. 10588) substantially upgraded the standard's performance requirements. It was the intention of the NHTSA that the notice upgrading the standard be considered as the final rule and supersede the notice responding to petitions. Hereafter, the notice responding to petitions will be referred to as Notice 1, while the notice upgrading the standard will be referred to as Notice 2.

On October 27, 1974, the Motor Vehicle and Schoolbus Safety Amendments of 1974 (P.L. 93-492) were signed into law. These amendments to the National Traffic and Motor Vehicle Safety Act incorporate Standard No. 301 as it was published in Notice 2 on March 21, 1974. According to the amendment the technical errors which appeared in Notice 2 may be corrected, while future amendments are prohibited from diminishing the level of motor vehicle safety which was established in the notice. The changes contained in this notice conform to these statutory requirements.

Due to an oversight, Notice 2 failed to include two provisions which appeared in Notice 1. The limitation of the standard's application to vehicles which use fuel with a boiling point above 32°F was inadvertently omitted in Notice 2 and is hereby reinstated. Notice 2 also failed to include a provision specifying that vehicles not be

altered during the testing sequences. It was the intent of the NHTSA that damage or other alteration of the vehicle incurred during the barrier crashes not be corrected prior to the static rollover tests. The test requirements are therefore amended to prohibit the alteration of vehicles following each of the specified test impacts.

In order to clarify the manner in which the load is to be distributed during testing of multipurpose passenger vehicles, trucks, and buses, S7.1.5(b) is amended to require that when the weight on one of the axles exceeds its proportional share of the loaded vehicle weight, when the vehicle is loaded only with dummies, the remainder of the required test weight shall be placed on the other axle, so that the weight on the first axle remains the same. The loading specification did not specifically address this contingency.

The requirement that the load be located in the load carrying area of multipurpose passenger vehicles, trucks, and buses during testing is deleted since the agency has determined that such a limitation is consistent with the provision specifying distribution of weight in proportion with the vehicle's gross axle weight ratings.

Petitions for reconsideration were received from eleven petitioners. Although only those comments raising issues found to be significant have been discussed, due consideration has been given to all requests. Any requests not specifically discussed herein are denied.

A substantial number of petitioners objected to the requirement that dummies used during testing be restrained only by passive means installed at the seating positions. Petitioners pointed out that mandatory passive restraint systems proposed in Standard No. 208 have a proposed effective date of September 1, 1976; one year after the September 1, 1975 effective

date set for implementation of Standard 301. This would leave a period of time when most dummies would be involved in testing while totally unrestrained. Renault, Jeep, American Motors, Mercedes-Benz, General Motors, and Ford requested that the dummies be restrained during testing by whatever means, active or passive, are installed at the particular seating positions. To provide otherwise, they argued, would unnecessarily expose the dummies to costly damage when subjected to impacts in an unrestrained condition.

The NHTSA finds petitioners' objections meritorious. Although this agency has determined that reliable test results can be best obtained when occupant weight is included in the vehicle during crash testing, the manner in which that weight is installed is subject to additional considerations. The NHTSA has made clear its desire to enable simultaneous testing under more than one standard where the test requirements are compatible. Standards 301 and 208 both require frontal and lateral barrier crash tests which can be conducted concurrently if the vehicles are loaded uniformly. Since Standard 208 provides for crash testing with dummies in vehicles with passive restraint systems, Standard 301 testing of these same vehicles should be conducted with dummies installed in the seating positions provided under Standard 208. The presence of the passive restraints will protect the dummies from unnecessary damage and the required testing for compliance with both standards can be accomplished simultaneously. Where a vehicle is not equipped with passive restraints, and Standard 208 testing is not mandated, weight equal to that of a 50th percentile test dummy should be secured to the floor pan at the front outboard designated seating positions in the vehicles being tested.

Further concern over the damage to which test dummies might be exposed was manifested by Jeep and American Motors. They petitioned for the removal of the dummies prior to the static rollover tests, arguing that their presence serves no safety-related purpose. The NHTSA has granted the request, on the basis of its determination that the dummies would have little or no effect on the fuel system's integrity during the rollover segment of the test procedure.

Jeep and American Motors further suggested that the standard specify that hardware and instrumentation be removed prior to the static rollover test in order to prevent its damage. This request is denied as unnecessary. Standard No. 301 contains no specification for the inclusion of instrumentation during testing. Any instrumentation present in the vehicle is there by decision of the manufacturer to assist him in monitoring the behavior of the fuel system during testing, and must be installed and utilized in such a manner as not to affect the test results. Therefore, as long as the loading requirements of the standard are met, manufacturers may deal with their instrumentation in any fashion they wish, as long as the test results are unaffected.

Volkswagen urged that unrestrained dummies not be required during the rear moving impact test, citing the absence of such a test in Standard 208 and alleging that the integrity of vehicle fuel systems would not be greatly affected by the presence of dummies. This request is denied. The rear moving barrier crash specified in proposed Standard 207, *Seating Systems*, provides for the installation of dummies in the same seating positions as required for Standard 301, thus permitting simultaneous conduct of the rear barrier crashes required by both standards. In order to obtain realistic and reliable test results, occupant weight must be in vehicles during Standard 301 crash testing. The NHTSA has determined that unrestrained dummies would have, at most, slight vulnerability to damage during rear barrier crash tests, since the impact is such that the seats themselves serve as protective restraint mechanisms. It has therefore been concluded that the best method for including occupant weight during rear barrier crash testing is with test dummies.

Notice 2 specified that the parking brake be engaged during the rear moving barrier crash test. Ford requested in its petition for reconsideration that this requirement be changed in order to enable simultaneous rear barrier crash testing with Standard 207 which provides for disengagement of the parking brake in its recent proposal. The NHTSA has decided to grant Ford's request. The condition of the parking brake during this test sequence would not so significantly affect the test results as to warrant



retention of a requirement that would prevent simultaneous testing.

The Recreational Vehicle Institute objected to the standard, arguing that it was not cost-effective as applied to motor homes. RVI requested that different test procedures be developed for motor home manufacturers. Specifically it objected to what it suggested was a requirement for unnecessary double testing in situations where the incomplete vehicle has already been tested before the motor home manufacturer receives it. RVI expressed the view that the motor home manufacturer should not have to concern himself with compliance to the extent that he must test the entire vehicle in accordance with the standard's test procedures.

The NHTSA has found the requirements of Standard 301 to be reasonable in that they enforce a level of safety that has been determined necessary and provide adequate lead time for manufacturers to develop methods and means of compliance. The National Traffic and Motor Vehicle Safety Act does not require a manufacturer to test vehicles by any particular method. It does require that he exercise due care in assuring himself that his vehicles are capable of satisfying the performance requirements of applicable standards when tested in the manner prescribed. This may be accomplished, however, by whatever means the manufacturer reasonably determines to be reliable. If the final stage manufacturer of a motor home concludes that additional testing by him of the entire vehicle for compliance is unnecessary, and he has exercised due care in completing the vehicle in a manner that continues its conformity to applicable standards, he is under no obligation to repeat the procedures of the standards.

RVI further pressed its contention that the standard is not cost-beneficial by arguing that the agency has not provided specific data indicating a frequency of fuel system fires in motor homes that would justify the costs imposed by the standard.

Sufficient record evidence has been found to support the conclusion that fuel spillage in the types of crashes with which the standard deals is a major safety hazard. The only basis upon which motor home manufacturers could justify

the execution of their vehicles from Standard 301's requirements would be an inherent immunity from gasoline spillage. The standard establishes a reasonable test of a vehicle's ability to withstand impacts without experiencing fuel loss. If a motor home is designed in such a way as to preclude the spillage of fuel during the prescribed test impacts, compliance with the standard should present no significant hardship.

Volkswagen challenged the cost-benefit rationale of the more extensive performance requirements contained in Notice 2, and proposed that only the rear barrier crash be retained, if sufficient data exists to support its inclusion. The agency has carefully considered the issues raised in the Volkswagen petition. As discussed earlier, Standard 301 has been designed to allow testing for its requirements with some of the same barrier crash tests that are required by other standards: 208, 204, 212, and 207. This should reduce substantially the costs of testing to Standard 301, especially when viewed on a cost-per-vehicle basis. The NHTSA has concluded that the changes necessary for vehicles to comply with the standard are practicable and that the need for such increased fuel system integrity is sufficient to justify the costs.

The Recreational Vehicle Institute also urged that the effective date for motor homes be delayed 1 year beyond the date set for application of the standard to other vehicles. RVI contends that a uniform effective date for all manufacturers will create serious problems for the motor home manufacturer who will not have complying incomplete vehicles available to him until the effective date of the standard.

The NHTSA finds RVI's argument lacking in merit. Adequate lead time has been provided in Standard 301 to allow final stage manufacturers of multistage vehicles to become familiar with the requirements and to assure themselves that chassis and other vehicle components are available sufficiently in advance of the effective date to enable timely compliance. The availability of complying incomplete vehicles is a situation that should properly be resolved in the commercial dealings between motor home manufacturers and their suppliers. If the motor home manufacturer is unable to obtain complying in-



complete vehicles far enough in advance of the standard's effective date, he might, for example, work out an arrangement with his supplier whereby the supplier will provide information relating to the manner in which the incomplete vehicle must be completed in order to remain in compliance with all applicable safety standards. The lead time provided in the standards is planned to take into account the needs of persons at each stage of the manufacturing process, including final stage manufacturers.

Jeep, American Motors, and Toyota urged delays in the implementation of various aspects of the standard. Jeep suggested a new schedule for application of the standard's requirements to multipurpose passenger vehicles, trucks, and buses, stating that the current lead time is insufficient to enable completion of necessary design changes and compliance testing. American Motors requested a 1-year delay in the effective date for the static rollover test in order to allow satisfactory completion of the required Environmental Protection Agency 50,000 mile durability test. Once vehicles have completed required EPA testing and certification, their fuel system components cannot be altered. AMC says that it cannot make the design changes necessary for Standard 301 compliance in time to utilize them in this year's EPA tests. AMC also desires a 2-year delay in the frontal angular, rear, and lateral impact tests, alleging that that constitutes the minimum time necessary to produce designs that comply. Toyota asked for a delay in the frontal angular crash test for all passenger vehicles until 1978, in order to allow them sufficient time to develop a satisfactory means of compliance with the specified performance level.

All of these requests are denied. The lead time that has been provided for compliance with Standard 301 is found adequate and reasonable. The rollover requirements have been in rule form for over a year, and the more extensive requirements were proposed more than 3 years in advance of their effective dates. Considering the urgent need for stronger and more durable fuel systems, further delay of the effective dates is not justified. On the basis of all information available, the NHTSA has determined that development of complying fuel systems can be attained in the time allowed. In addition, Con-

gress has expressed in the recently enacted amendments to the National Traffic and Motor Vehicle Safety Act its decision that the effective dates specified in Notice 2 should be strictly adhered to.

Toyota requested that the requirements of the rear moving barrier crash not be imposed on vehicles with station wagon or hatch-back bodies, alleging difficulty in relocation of the fuel tank to an invulnerable position. The request is denied as the NHTSA has determined that satisfaction of the rear barrier crash requirements by station wagons and hatch-backs is practicable and necessary.

Volkswagen raised several objections in its petition to the static rollover test, including assertions that the test does not reflect real world accidents, and that the test procedure is unclear since the direction of rotation is unspecified.

The NHTSA does not consider these arguments to be germane. It is true that the static rollover test, like any "static" test, is not designed as a simulation of the actual behavior of a vehicle in a dynamic crash situation. It is intended rather as a laboratory method of quantitatively measuring the vehicle properties that contribute to safety in a range of crash situations. The NHTSA has found that a vehicle's performance in the static rollover test is directly related to the fuel system integrity that is the goal of the standard, and is an appropriate means of measuring that aspect of performance.

With regard to the direction of rotation, the NHTSA has stipulated that only a certain amount of fuel may escape during a 360° rotation of a vehicle on its longitudinal axis. The vehicle must be capable of meeting this performance level regardless of the direction of its rotation.

British Leyland (in a petition for rulemaking) and Volkswagen requested revision of the aspect of the barrier crash requirement limiting the amount of fuel spillage taking place from impact until motion of the vehicle has ceased. They stated that the current 1-ounce limitation is too difficult to measure in the period while the vehicle is moving and suggested that fuel spillage be averaged over the period from impact until 5 minutes following the cessation of motion.

The NHTSA must deny this request. The purpose of the current limitation on the spillage of fuel during the impact and post-impact motion is to prohibit the sudden loss of several ounces of fuel which might occur, as an example, by the displacement of the filler cap. Simultaneous loss of several ounces of fuel during the impact and subsequent vehicle motion could have a fire-causing potential, because of sparks that are likely to be given off during a skid or metal contact between vehicles.

Chrysler petitioned to have the requirement specifying that the moving barrier be guided during the entire impact sequence deleted in favor of a requirement that would allow the termination of guidance of the barrier immediately prior to impact. They argued that their suggested procedure is more representative of real world impacts.

The request is denied. The condition that there be no transverse or rotational movement of the barrier, which has been in effect since January 1, 1972, eliminates random variations between different tests and therefore makes the standard more repeatable and objective as required by the statute.

Jeep requested clarification that a given vehicle is only required to be subjected to one of the specified barrier impacts followed by a static rollover. This request is granted as it follows the

agency's intent and the standard is not specific on that point. Section S6. is amended to require that a single vehicle need only be capable of meeting a single crash test followed by a static rollover.

American Motors submitted a request that the agency finds repetitious of previous petitions, urging that vehicle fluids be stabilized at ambient temperatures prior to testing. In responding to earlier petitions for reconsideration from MVMA and GM in Notice 1, the NHTSA denied a request for temperature specification, stating that it intended that the full spectrum of temperatures encountered on the road be reflected in the test procedure. That continues to be this agency's position.

In light of the foregoing S3., S6., S6.1, S6.3, S7.1.4, and S7.1.5 of Standard No. 301, *Fuel System Integrity*, (49 CFR 571.301) are amended . . .

*Effective date:* September 1, 1975, with additional requirements effective September 1, 1976 and September 1, 1977, as indicated.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on November 15, 1974.

James B. Gregory  
Administrator

39 F.R. 40857

November 21, 1974





**PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75****Fuel System Integrity****(Docket No. 73-20; Notice 6)**

This notice amends Standard No. 301, *Fuel System Integrity* (49 CFR 571.301), to specify new loading conditions and to establish a 30-minute fuel spillage measurement period following barrier crash tests.

On April 16, 1975, the NHTSA published a notice (40 F.R. 17036) proposing a revision of the loading conditions and fuel spillage measurement period requirement in Standard 301. The NHTSA also proposed in that notice an extension of the applicability of Standard 301 to school buses with a GVWR in excess of 10,000 pounds. At the request of several Members of Congress, the due date for comments on the school bus proposal was extended to June 26, 1975, and final rulemaking action on it will appear in a later Federal Register notice.

It was proposed that the current 15-minute fuel spillage measurement period be extended to 30 minutes in order to allow more time for leaks to be located and rates of flow to be established. Measurement of fuel loss during only a 15 minute time period is difficult because fuel may be escaping from various parts of the vehicle where it is not readily detectable. Chrysler, American Motors, and General Motors objected to the proposed change and asked that it either not be adopted or that adoption be delayed for one year until September 1, 1976.

The commenters argued that the revision was unnecessary and would involve a change in their testing methods. The NHTSA has fully considered these arguments and does not consider the amendment to prescribe a higher level of performance. It concludes that the 30-minute measurement period is necessary to achieve accurate measurement of fuel loss and assessment of vehicle compliance and accordingly amends

Standard 301 to prescribe the longer period for measurement.

The April 16, 1975, notice also proposed a change in the Standard 301 loading conditions to specify that 50th percentile test dummies be placed in specified seating positions during the frontal and lateral barrier crash tests, and that they be restrained by means installed in the vehicle for protection at the particular seating position. Currently the standard requires (during the frontal and lateral barrier crash tests) ballast weight secured at the specified designated seating positions in vehicles not equipped with passive restraint systems. In vehicles equipped with passive restraints, 50th percentile test dummies are to be placed in the specified seating positions during testing.

In petitions for reconsideration of this amendment to Standard No. 301 (39 F.R. 40857) various motor vehicle manufacturers stated that attachment of such ballast weight to the vehicle floor pans during the barrier crashes would exert unrealistic stresses on the vehicle structure which would not exist in an actual crash. The NHTSA found merit in petitioners' arguments, and its proposed revision of the loading conditions is intended to make the crash tests more representative of real-life situations.

Only Mazda objected to the proposal. It argued that curb weight be prescribed as the loading condition so that it could conduct Standard 301 compliance testing concurrently with testing for Standards No. 212 and 204. The NHTSA does not find merit in Mazda's request as the Standard 301 loading condition is considered necessary to assure an adequate level of fuel system integrity. Since the proposed loading conditions are more stringent than a curb weight

condition, manufacturers could conduct compliance testing for Standards 301, 212, and 204 simultaneously. If the vehicle complied with the requirements of Standards 212 and 204 when loaded according to 301 specifications, the manufacturer presumably could certify the capability of the vehicles to comply with the performance requirements of 212 and 204 when loaded to curb weight. It should be noted that the NHTSA is considering amending Standards 212 and 204 to specify the same loading conditions as proposed for Standard 301.

All other commenters supported immediate adoption of the proposed loading conditions. Therefore, the NHTSA adopts the loading conditions as they were proposed in the April 16, 1975, notice.

In consideration of the foregoing, S5.5 and S7.1.6 of Motor Vehicle Safety Standard No.

301, *Fuel System Integrity* (49 CFR 571.301), are amended to read as follows:

*Effective date:* Because this amendment revises certain requirements that are part of 49 CFR 571.301-75, Motor Vehicle Safety Standard 301-75, effective September 1, 1975, and creates no additional burden upon any person, it is found for good cause shown that an effective date of less than 180 days after publication is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued August 1, 1975.

Robert L. Carter  
Acting Administrator

**40 F.R. 33036**  
**August 6, 1975**

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75

### Fuel System Integrity

(Docket No. 73-20; Notice 7)

This notice responds to a petition for reconsideration of the notice published August 6, 1975 (40 FR 33036), which amended Standard No. 301, *Fuel System Integrity* (49 CFR 571.301), to specify new loading conditions and establish a 30-minute fuel spillage measurement period following a barrier crash test.

American Motors Corporation (AMC) has petitioned for reconsideration of the amendment to S5.5 of Standard No. 301 insofar as it establishes an effective date of September 1, 1975, for the 30-minute fuel spillage requirement. AMC requests that the effective date for the 30-minute fuel spillage measurement time be delayed for 180 days from the date of publication of the rule.

The NHTSA has determined that AMC's petition has merit. AMC argues that the imposition of an effective date 25 days after the publication of the rule is burdensome because the 30-minute spillage requirement is a more stringent requirement than the previous 15-minute requirement and therefore requires additional testing to determine compliance. The NHTSA agrees that 25 days is not enough time to complete the addi-

tional testing. However, the effective date will be postponed 12 months instead of the 6 months requested by AMC so that manufacturers will not have to conduct compliance testing for 1976 model vehicles already certified under the old 15-minute spillage requirement. For these reasons the petition of American Motors Corporation is granted.

In S5.5 of Standard No. 301, *Fuel System Integrity*, (49 CFR 571.301), the amendment of August 6, 1975 (40 FR 33036), changing the term "10-minute period" to "25-minute period" effective September 1, 1975, is hereby made effective September 1, 1976.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51).

Issued on October 3, 1975.

Gene G. Mannella  
Acting Administrator

40 F.R. 47790  
October 10, 1975





## **PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75**

### **Fuel System Integrity**

**(Docket No. 73-20; Notice 8)**

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 301, *Fuel System Integrity* (49 CFR 571.301) to extend the applicability of the standard to school buses with a GVWR in excess of 10,000 pounds. The amendment specifies conditions for a moving contoured barrier crash for school buses in order to determine the amount of fuel spillage following impact.

On October 27, 1974, the Motor Vehicle and Schoolbus Safety Amendments of 1974, amending the National Traffic and Motor Vehicle Safety Act, were signed into law (Pub. L. 93-492, 88 Stat. 1470). Section 103(i)(1)(A) of the Act, as amended, orders the promulgation of a safety standard establishing minimum requirements for the fuel system integrity of school buses. Standard No. 301 currently contains requirements for school buses with a GVWR of 10,000 pounds or less which will become effective beginning September 1, 1976. Larger school buses, which comprise approximately 90 percent of the school bus population, will be included in Standard No. 301 by this amendment.

A proposal to amend Standard No. 301 with respect to school buses, loading conditions, and spillage measurement time was published on April 16, 1975 (40 FR 17036). An amendment to the Standard specifying certain loading conditions and establishing a 30-minute fuel spillage measurement period was published on August 6, 1975 (40 FR 33036). At the request of several members of Congress, the period for comments on the school bus proposals was extended. This notice responds to the comments received with respect to the inclusion of school buses within the requirements of the standard.

Seven manufacturers opposed the requirement of a single impact test by a moving contoured barrier at any point on the school bus body, arguing that such a requirement would necessitate a proliferation of expensive tests in order to ensure compliance at every conceivable point of impact. The NHTSA does not agree. Although not specifying a particular impact point, the test condition allows for testing at the few most vulnerable points of each kind of school bus fuel system configuration. Therefore, only impacts at those points are necessary to determine compliance. On the basis of its knowledge of the bus design, a manufacturer should be able to make at least an approximate determination of the most vulnerable points on the bus body.

Two school bus body manufacturers requested a requirement that the manufacturer who installs the fuel system be responsible for compliance testing, while one chassis manufacturer argued that responsibility for compliance should rest with the final manufacturer. In most cases, if the basic fuel system components are included in the chassis as delivered by its manufacturer, the multistage vehicle regulations of 49 CFR Part 568 require the chassis manufacturer at least to describe the conditions under which the completed vehicle will conform, since it could not truthfully state that the design of the chassis has no substantial determining effect on conformity. Beyond that, however, the NHTSA position is that the decision as to who should perform the tests and who should take the responsibility is best not regulated by the government. The effect of Part 568 is to allow the final-stage manufacturer to avoid primary responsibility for conformity to a standard if it completes the vehicle in accordance with the conditions or instructions furnished with the incomplete vehicle by its man-

ufacturer. Whether it does so is a decision it must make in light of all the circumstances.

This notice extends the proposed exclusion for vehicles that use fuel with a boiling point below 32° F. to school buses having a GVWR greater than 10,000 pounds. Fuel systems using gaseous fuels are not subject to the spillage problems against which this standard is directed.

The Vehicle Equipment Safety Commission requested that school buses be required to undergo static rollover tests and that the engine be running during the tests. Upon consideration, the NHTSA finds that a static rollover test for school buses is impractical in light of the expensive test facility that would be required. A requirement that the engine be running during the impact test would make little difference in the resulting fuel spillage. Since the standard requires that the fuel tank be filled with Stoddard solvent during the impact test, the test vehicle would have to be equipped with an auxiliary fuel system for the engine. The expense of modifying the test vehicle to allow the engine to run during the test would not justify the minimal benefits resulting from a requirement that the engine be running. However, the fuel system integrity of school buses will be continually monitored and analyzed by the NHSTA. Therefore, suggestions such as these may be the subject of future rulemaking.

One school bus body manufacturer cited the infrequency of school bus fires resulting from collisions as a reason for ameliorating or eliminating altogether fuel system integrity requirements for school buses. In promulgating these amendments to Standard No. 301, the NHTSA is acting under the statutory mandate to develop regulations concerning school bus fuel systems. This statute reflects the need, evidently strongly felt by the public, to protect the children who ride in the school buses. They and their parents have little direct control over the types of vehicles in which they ride to school, and are therefore not in a position to determine the safety of the vehicles. Considering the high regard expressed by the public for the safety of its children, the NHTSA finds it important that the school bus standards be effective and meaningful.

The California Highway Patrol expressed the concern that these amendments would preempt State regulations to the extent that the State would be precluded from specifying the location of fuel tanks, fillers, vents, and drain openings in school buses. The standard will unavoidably have that effect, by the operation of section 103(d) of the National Traffic and Motor Vehicle Safety Act. However, although a State may not have regulations of general applicability that bear on these aspects of performance, the second sentence of the same section makes it clear that a State or political subdivision may specify higher standards of performance for vehicles purchased for its own use, although of course the Federal standards must be met in any case.

In addition to provisions directly relating to school buses, this notice clarifies the loading condition amendments in the notice of August 6, 1975, by amending S6.1 to provide for testing with 50th percentile dummies. The wording of S6.1 is identical to that of the proposal.

In light of the foregoing, 49 CFR 571.301, Motor Vehicle Safety Standard No. 301, is amended. . . .

*Effective date:* July 15, 1976, in conformity with the schedule mandated by the 1974 Amendments to the Traffic Safety Act. However, the effective date of the amendment of S6.1 is October 15, 1975. Because the amendment to that paragraph clarifies the revision of certain requirements which became effective September 1, 1975, it is found for good cause shown that an effective date for the amendment of S6.1 less than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 202, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392); delegations of authority at 49 CFR 1.51 and 501.8).

Issued on October 8, 1975.

Gene G. Mannella  
Acting Administrator  
**40 F.R. 48352**  
**October 15, 1975**



## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75

### Fuel System Integrity

(Docket No. 73-20; Notice 9)

This notice clarifies the effective date of the change in Standard No. 301-75 (49 CFR 571.301-75) from a 15-minute to a 30-minute fuel spillage measurement period following cessation of motion in barrier crash tests.

Until August 1975, S5.4 of Standard No. 301-75 specified a 15-minute fuel spillage measurement period for the barrier crash test requirements that would become effective September 1, 1975. To allow more time for leaks to be located and rates of flow to be established, that period was extended to 30 minutes in Notice 6 (40 FR 33036, August 6, 1975; correction of section numbers at 40 FR 37042, August 25, 1975). Notice 6 set the effective date of the change as September 1, 1975.

In response to a petition for reconsideration filed by American Motors Corporation, the NHTSA in Notice 7 (40 FR 47790; October 10, 1975) delayed for 1 year the effective date of that change, thereby establishing the following scheme: a 15-minute period would be used in applying the standard to vehicles manufactured before September 1, 1976, while a 30-minute measurement period would be used for vehicles manufactured after that date.

In Notice 8, which was published on October 15, 1975 (40 FR 48352), the loading conditions of S6.1 were revised, effective immediately, and the standard was extended to apply to school buses with a GVWR in excess of 10,000 pounds, effective July 15, 1976. Because these amendments were made by republishing the entire text

of the standard, it appeared that the effective date of the change from a 15-minute measurement period to a 30-minute measurement period had been advanced from September 1, 1976, to July 15, 1976, for all vehicles. The NHTSA did not intend such an advancement, and this notice amends the standard to reestablish the September 1, 1976, effective date for vehicles other than school buses with a GVWR greater than 10,000 pounds.

The following corrections of Notice 8 are also made: the standard is designated as "Standard No. 301-75" and typographical errors in S6.4 and S7.5.2 are corrected.

In consideration of the foregoing, § 571.301 of 49 CFR Part 571 (Standard No. 301, *Fuel System Integrity*), as published in the issue of October 15, 1975 (40 FR 48352), is redesignated as § 571.301-75 and amended. . . .

*Effective dates:* As set forth in the standard. Changes indicated in the text of the Code of Federal Regulations should be made immediately.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 108, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392 note); delegation of authority at 49 CFR 1.50.)

Issued on February 25, 1976.

James B. Gregory  
Administrator

41 F.R. 9350  
March 4, 1976



# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 301-75

## Fuel System Integrity

(Docket No. 73-03; Notice 07); (Docket No. 73-20; Notice 010);

(Docket No. 73-34; Notice 04); (Docket No. 75-02; Notice 03);

(Docket No. 75-03; Notice 05); (Docket No. 75-07; Notice 03);

(Docket No. 75-24; Notice 03)

This notice announces that the effective dates of the redefinition of "school bus" and of six Federal motor vehicle safety standards as they apply to school buses are changed to April 1, 1977, from the previously established effective dates. This notice also makes a minor amendment to Standard No. 220, *School Bus Rollover Protection*, and adds a figure to Standard No. 221, *School Bus Body Joint Strength*.

The Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Act) mandated the issuance of Federal motor vehicle safety standards for several aspects of school bus performance, Pub. L. 93-492, § 202 (15 U.S.C. § 1392(i) (1)(A)). These amendments included a definition of school bus that necessitated a revision of the existing definition used by the NHTSA in establishing safety requirements. The Act also specified that the new requirements "apply to each schoolbus and item of schoolbus equipment which is manufactured . . . on or after the expiration of the 9-month period which begins on the date of promulgation of such safety standards." (15 U.S.C. § 1392(i) (1)(B)).

Pursuant to the Act, amendments were made to the following standards: Standard No. 301-75, *Fuel System Integrity* (49 CFR 571.301-75), effective July 15, 1976, for school buses not already covered by the standard (40 FR 483521, October 15, 1975); Standard No. 105-75, *Hydraulic Brake Systems* (49 CFR 571.105-75), effective October 12, 1976 (41 FR 2391, January 16, 1976); and Standard No. 217, *Bus Window Retention and Release* (49 CFR 571.217), effective for school buses on October 26, 1976 (41 FR 3871, January 27, 1976).

In addition, the following new standards were added to Part 571 of Title 49 of the Code of Federal Regulations, effective October 26, 1976: Standard No. 220, *School Bus Rollover Protection* (41 FR 3874, January 27, 1976); Standard No. 221, *School Bus Body Joint Strength* (41 FR 3872, January 26, 1976); and Standard No. 222, *School Bus Passenger Seating and Crash Protection* (41 FR 4016, January 28, 1976). Also, the existing definition of "school bus" was amended, effective October 27, 1976, in line with the date set by the Act for issuance of the standards.

The Act was recently amended by Public Law 94-346 (July 8, 1976) to change the effective dates of the school bus standards to April 1, 1977 (15 U.S.C. § 1392(i) (1)(B)). This notice is intended to advise interested persons of these changes of effective dates. In the case of Standard No. 301-75, the change of effective date is reflected in a conforming amendment to S5.4 of that standard. A similar amendment is made in S3 of Standard No. 105-75.

The agency concludes that the October 27, 1976, effective date for the redefinition of "school bus" should be postponed to April 1, 1977, to conform to the new effective dates for the upcoming requirements. If this were not done, the new classes of school buses would be required to meet existing standards that apply to school buses (e.g., Standard No. 108 (49 CFR 571.108)) before being required to meet the new standards. This would result in two stages of compliance, and would complicate the redesign efforts that Congress sought to relieve.



This notice also amends Standard No. 220 in response to an interpretation request by Blue Bird Body Company, and Sheller-Globe Corporation's petition for reconsideration of the standard. Both companies request confirmation that the standard's requirement to operate emergency exits during the application of force to the vehicle roof (S4(b)) does not apply to roof exits which are covered by the force application plate. The agency did not intend to require the operation of roof exits while the force application plate is in place on the vehicle. Accordingly, an appropriate amendment has been made to S4(b) of the standard.

With regard to Standard No. 220, Sheller-Globe also requested information that, in testing its school buses that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less, it may test with a force application plate with dimensions other than those specified in the standard. The standard does not prohibit a manufacturer from using a different dimension from that specified, in view of the NHTSA's expressed position on the legal effect of its regulations. To certify compliance, a manufacturer is free to choose any means, in the exercise of due care, to show that a vehicle (or item of motor vehicle equipment) would comply if tested by the NHTSA as specified in the standard. Thus the force application plate used by the NHTSA need not be duplicated by each manufacturer or compliance test facility. Sheller-Globe, for example, is free to use a force application plate of any width as long as it can certify its vehicle would comply if tested by the NHTSA according to the standard.

In a separate area, the agency corrects the inadvertent omission of an illustration from Standard No. 221 as it was issued January 26, 1976 (41 FR 3872). The figure does not differ from that proposed and, in that form, it received no adverse comment.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including pos-

sible loss of safety benefits. The changes in effective dates for the school bus standards are not evaluated because they were accomplished by law and not by regulatory action.

The change of effective date for the redefinition of "school bus" will result in savings to manufacturers who will not be required to meet existing school bus standards between October 27, 1976, and April 1, 1977. The agency calculates that the only standard that would not be met would be the requirement in Standard No. 108 for school bus marker lamps. In view of the agency's existing provision for the marking of night school buses in Pupil Transportation Standard No. 17 (23 CFR 1204), it is concluded that the absence of this equipment until April 1, 1977, will not have a significant adverse impact on safety.

The interpretative amendment of Standard No. 220 and the addition of a figure to Standard No. 221 are not expected to affect the manufacture or operation of school buses.

In consideration of the foregoing, Part 571 of Title 49 of the Code of Federal Regulations is amended. . . .

*Effective dates:*

1. Because the listed amendments do not impose additional requirements of any person, the National Highway Traffic Safety Administration finds that an immediate effective date of August 26, 1976 is in the public interest.

2. The effective date of the redefinition of "school bus" in 49 CFR Part 571.3 that was published in the issue of December 31, 1976 (40 FR 60033) is changed to April 1, 1977.

3. The effective dates of Standard Nos. 105-75, 217, 301-75, 220, 221, and 222( as they apply to school buses) are April 1, 1977, in accordance with Public Law 94-346.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Pub. L. 94-346, Stat. (15 U.S.C. § 1392(i)(1)(B)); delegation of authority at 49 CFR 1.50.)

Issued on August 17, 1976.

John W. Snow  
Administrator

41 F.R. 36026  
August 26, 1976

## MOTOR VEHICLE SAFETY STANDARD NO. 301-75

### Fuel System Integrity

**S1. Scope.** This standard specifies requirements for the integrity of motor vehicle fuel systems.

**S2. Purpose.** The purpose of this standard is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes.

**S3. Application.** This standard applies to passenger cars, and to multipurpose passenger vehicles, trucks, and buses that have a GVWR of 10,000 pounds or less and use fuel with a boiling point above 32° F., and to school buses that have a GVWR greater than 10,000 pounds and use fuel with a boiling point above 32° F.

**S4. Definition.** "Fuel spillage" means the fall, flow, or run of fuel from the vehicle but does not include wetness resulting from capillary action.

#### **S5. General requirements.**

**S5.1 Passenger cars.** Each passenger car manufactured from September 1, 1975, to August 31, 1976, shall meet the requirements of S6.1 in a perpendicular impact only, and S6.4. Each passenger car manufactured on or after September 1, 1976, shall meet all the requirements of S6, except S6.5.

**S5.2 Vehicles with GVWR of 6,000 pounds or less.** Each multipurpose passenger vehicle, truck, and bus with a GVWR of 6,000 pounds or less manufactured from September 1, 1976, to August 31, 1977, shall meet all the requirements of S6.1 in a perpendicular impact only, S6.2, and S6.4. Each of these types of vehicles manufactured on or after September 1, 1977, shall meet the requirements of S6, except S6.5.

**S5.3 Vehicles with GVWR of more than 6,000 pounds but not more than 10,000 pounds.** Each multipurpose passenger vehicle, truck, and bus

with a GVWR of more than 6,000 pounds but not more than 10,000 pounds manufactured from September 1, 1976, to August 31, 1977, shall meet the requirements of S6.1 in a perpendicular impact only. Each vehicle manufactured on or after September 1, 1977, shall meet all the requirements of S6, except S6.5.

**S5.4 School buses with a GVWR greater than 10,000 pounds.** Each school bus with a GVWR greater than 10,000 pounds manufactured on or after April 1, 1977, shall meet the requirements of S6.5.

**S5.5 Fuel spillage: Barrier crash.** Fuel spillage in any fixed or moving barrier crash test shall not exceed 1 ounce by weight from impact until motion of the vehicle has ceased, and shall not exceed a total of 5 ounces by weight in the 5-minute period following cessation of motion. For the subsequent 25-minute period (for vehicles manufactured before September 1, 1976, other than school buses with a GVWR greater than 10,000 pounds: the subsequent 10-minute period), fuel spillage during any 1-minute interval shall not exceed 1 ounce by weight.

**S5.6 Fuel spillage: Rollover.** Fuel spillage in any rollover test, from the onset of rotational motion, shall not exceed a total of 5 ounces by weight for the first 5 minutes of testing at each successive 90° increment. For the remaining testing period, at each increment of 90° fuel spillage during any 1-minute interval shall not exceed 1 ounce by weight.

**S6. Test requirements.** Each vehicle with a GVWR of 10,000 pounds or less shall be capable of meeting the requirements of any applicable



barrier crash test followed by a static rollover, without alteration of the vehicle during the test sequence. A particular vehicle need not meet further requirements after having been subjected to a single barrier crash test and a static rollover test.

**S6.1 Frontal barrier crash.** When the vehicle traveling longitudinally forward at any speed up to and including 30 mph impacts a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30° in either direction from the perpendicular to the line of travel of the vehicle, with 50th-percentile test dummies as specified in Part 572 of this chapter at each front outboard designated seating position and at any other position whose protection system is required to be tested by a dummy under the provisions of Standard No. 208, under the applicable conditions of S7, fuel spillage shall not exceed the limits of S5.5. (Effective: October 15, 1975)

**S6.2 Rear moving barrier crash.** When the vehicle is impacted from the rear by a barrier moving at 30 mph, with test dummies as specified in Part 572 of this chapter at each front outboard designated seating position, under the applicable conditions of S7, fuel spillage shall not exceed the limits of S5.5.

**S6.3 Lateral moving barrier crash.** When the vehicle is impacted laterally on either side by a barrier moving at 20 mph with 50th-percentile test dummies as specified in Part 572 of this chapter at positions required for testing to Standard No. 208, under the applicable conditions of S7, fuel spillage shall not exceed the limits of S5.5.

**S6.4 Static rollover.** When the vehicle is rotated on its longitudinal axis to each successive increment of 90°, following an impact crash of S6.1, S6.2, or S6.3, fuel spillage shall not exceed the limits of S5.6.

**S6.5 Moving contoured barrier crash.** When the moving contoured barrier assembly traveling longitudinally forward at any speed up to and including 30 mph impacts the test vehicle (school bus with a GVWR exceeding 10,000 pounds) at any

point and angle, under the applicable conditions of S7.1 and S7.5, fuel spillage shall not exceed the limits of S5.5.

**S7. Test conditions.** The requirements of S5 and S6 shall be met under the following conditions. Where a range of conditions is specified, the vehicle must be capable of meeting the requirements at all points within the range.

**S7.1 General test conditions.** The following conditions apply to all tests:

**S7.1.1** The fuel tank is filled to any level from 90 to 95 percent of capacity with Stoddard solvent, having the physical and chemical properties of type 1 solvent, Table I ASTM Standard D484-71, "Standard Specifications for Hydrocarbon Dry Cleaning Solvents."

**S7.1.2** The fuel system other than the fuel tank is filled with Stoddard solvent to its normal operating level.

**S7.1.3** In meeting the requirements of S6.1 through S6.3, if the vehicle has an electrically driven fuel pump that normally runs when the vehicle's electrical system is activated, it is operating at the time of the barrier crash.

**S7.1.4** The parking brake is disengaged and the transmission is in neutral, except that in meeting the requirements of S6.5 the parking brake is set.

**S7.1.5** Tires are inflated to manufacturer's specifications.

**S7.1.6** The vehicle, including test devices and instrumentation, is loaded as follows:

(a) Except as specified in S7.1.1, a passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus the necessary test dummies as specified in S6, restrained only by means that are installed in the vehicle for protection at its seating position.

(b) Except as specified in S7.1.1, a multipurpose passenger vehicle, truck, or bus with a GVWR of 10,000 pounds or less is loaded to its unloaded vehicle weight, plus the necessary test dummies, as specified in S6, plus 300 pounds of its rated cargo and luggage capacity weight, whichever is less, secured to the vehicle and dis-



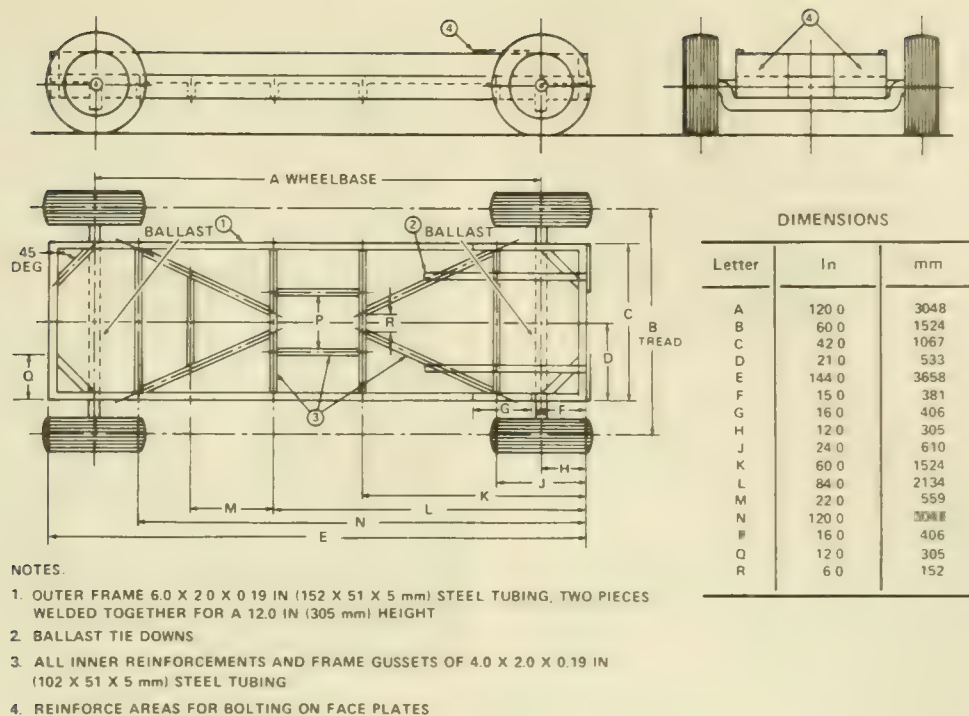


FIG. 1—COMMON CARRIAGE FOR MOVING BARRIERS

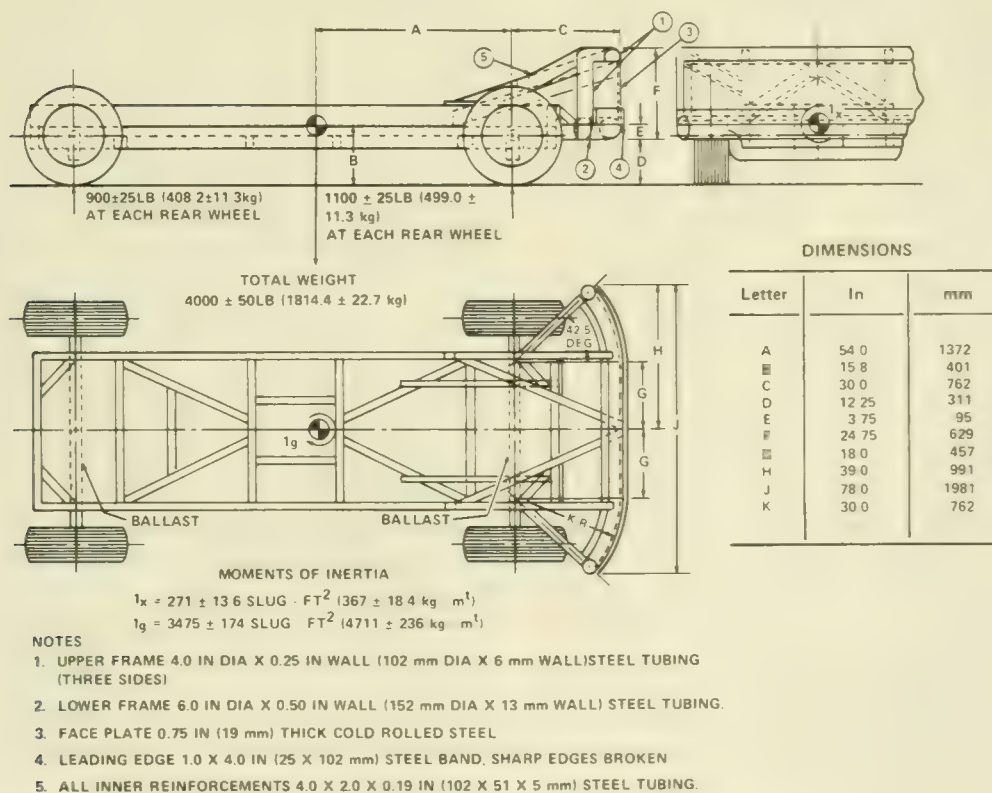


FIG. 2—COMMON CARRIAGE WITH CONTOURED IMPACT SURFACE ATTACHED

tributed so that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR. If the weight on any axle, when the vehicle is loaded to unloaded vehicle weight plus dummy weight, exceeds the axle's proportional share of the test weight, the remaining weight shall be placed so that the weight on that axle remains the same. Each dummy shall be restrained only by means that are installed in the vehicle for protection at its seating position.

(c) Except as specified in S7.1.1, a school bus with a GVWR greater than 10,000 pounds is loaded to its unloaded vehicle weight plus 120 pounds of unsecured weight at each designated seating position.

**S7.2 Lateral moving barrier crash test conditions.** The lateral moving barrier crash test conditions are those specified in S8.2 of Standard No. 208, 49 CFR 571.208.

**S7.3 Rear moving barrier test conditions.** The rear moving barrier test conditions are those specified in S8.2 of Standard No. 208, 49 CFR 571.208, except for the positioning of the barrier and the vehicle. The barrier and test vehicle are positioned so that at impact—

(a) The vehicle is at rest in its normal attitude;

(b) The barrier is traveling at 30 mph with its face perpendicular to the longitudinal centerline of the vehicle; and

(c) A vertical plane through the geometric center of the barrier impact surface and perpendicular to that surface coincides with the longitudinal centerline of the vehicle.

**S7.4 Static rollover test conditions.** The vehicle is rotated about its longitudinal axis, with the axis kept horizontal, to each successive increment of 90°, 180°, and 270° at a uniform rate, with 90° of rotation taking place in any time interval from 1 to 3 minutes. After reaching each 90° increment the vehicle is held in that position for 5 minutes.

**S7.5 Moving contoured barrier test conditions.** The following conditions apply to the moving contoured barrier crash test:

**S7.5.1.** The moving barrier, which is mounted on a carriage as specified in Figure 1, is of rigid construction, symmetrical about a vertical longitudinal plane. The contoured impact surface, which is 24.75 inches high and 78 inches wide, conforms to the dimensions shown in Figure 2, and is attached to the carriage as shown in that figure. The ground clearance to the lower edge of the impact surface is  $5.25 \pm 0.5$  inches. The wheelbase is  $120 \pm 2$  inches.

**S7.5.2** The moving contoured barrier, including the impact surface, supporting structure, and carriage, weighs  $4,000 \pm 50$  pounds with the weight distributed so that  $900 \pm 25$  pounds is at each rear wheel and  $1100 \pm 25$  pounds is at each front wheel. The center of gravity is located  $54.0 \pm 1.5$  inches rearward of the front wheel axis, in the vertical longitudinal plane of symmetry, 15.8 inches above the ground. The moment of inertia about the center of gravity is:

$$I_x = 271 \pm 13.6 \text{ slug ft}^2$$

$$I_z = 3475 \pm 174 \text{ slug ft}^3$$

**S7.5.3** The moving contoured barrier has a solid nonsteerable front axle and fixed rear axle attached directly to the frame rails with no spring or other type of suspension system on any wheel. (The moving barrier assembly is equipped with a braking device capable of stopping its motion.)

**S7.5.4** The moving barrier assembly is equipped with G78-15 pneumatic tires with a tread width of  $6.0 \pm 1$  inch, inflated to 24 psi.

**S7.5.5** The concrete surface upon which the vehicle is tested is level, rigid, and of uniform construction, with a skid number of 75 when measured in accordance with American Society of Testing and Materials Method E-274-65T at 40 mph, omitting water delivery as specified in paragraph 7.1 of that method.

**S7.5.6** The barrier assembly is released from the guidance mechanism immediately prior to impact with the vehicle.

38 F.R. 22397

August 20, 1973

40 F.R. 48352

October 15, 1975

**MOTOR VEHICLE SAFETY STANDARD NO. 302****Flammability of Interior Materials—Passenger Cars, Multipurpose Passenger Vehicles,  
Trucks, and Buses****(Docket No. 3-3; Notice 4)**

This notice amends § 575.21 of Title 49 of the Code of Federal Regulations by adding a new motor vehicle safety standard, No. 302, Flammability of Interior Materials. Notices of proposed rulemaking on the subject were published on December 31, 1969 (34 F.R. 20434) and June 26, 1970 (35 F.R. 10460).

As stated in the notice of December 31, 1969, the occurrence of thousands of fires per year that begin in vehicle interiors provide ample justification for a safety standard on flammability of interior materials. Although the qualities of interior materials cannot by themselves make occupants safe from the hazards of fuel-fed fires, it is important, when fires occur in the interior of the vehicle from such sources as matches, cigarettes, or short circuits in interior wiring, that there be sufficient time for the driver to stop the vehicle, and if necessary for occupants to leave it, before injury occurs.

The question on which the public responses to the above notices differed most widely was the burn rate limit to be required. The rate proposed was 4 inches per minute, measured by a horizontal test. Some manufacturers suggested maximum burn rates as high as 15 inches per minute. The Center for Auto Safety, the Textile Fibers and By-Products Association, and the National Cotton Batting Institute, on the other hand, suggested essentially a zero burn rate, or self-extinguishment, requirement, with a vertical rather than a horizontal test. A careful study was made of the available information on this subject, including the burn rates of materials currently in use or available for use, recommendations or regulations of other agencies, and the economic and technical consequences of various possible rate levels and types of tests. A con-

siderable amount of Bureau-sponsored research has been conducted and is continuing on the subject. On consideration of this data, the Bureau has decided to retain the 4-inch-per-minute burn limit, with the horizontal test, in this standard. It has been determined that suitable materials are not available in sufficient quantities, at reasonable costs, to meet a significantly more stringent burn rate by the effective date that is hereby established. The 4-inch rate will require a major upgrading of materials used in many areas, and a corresponding improvement in this aspect of motor vehicle safety. It is important that this standard not hinder manufacturers' efforts to comply with the crash protection requirements that are currently being imposed, and that in the Bureau's judgment are of the greatest importance. Further study will be made, however, of the feasibility of, and justification for, imposing more stringent requirements with a later effective date.

As pointed out in several comments, the problem of toxic combustion by-products is closely related to that of burn rate. Release of toxic gases is one of the injury-producing aspects of motor vehicle fires, and many of the common ways of treating materials to reduce their burn rates involve chemicals that produce highly poisonous gases such as hydrogen chloride and hydrogen cyanide. The problem of setting standards with regard to combustion by-products is difficult and complex, and the subject of continuing research under Bureau auspices. Until enough is known in this area to form the basis for a standard, and to establish the proper interaction between burn rate and toxicity, this uncertainty constitutes an additional reason for not requiring self-extinguishing materials.



The proposal specified a particular commercial gas for the test burn and several comments suggested problems in obtaining the gas for manufacture testing. As is the case with all the motor vehicle safety standards, the test procedures describe the tests that the regulated vehicles or equipment must be capable of passing, when tested by the Bureau, and not the method by which a manufacturer must ascertain that capability. Any gas with at least as high a flame temperature as the gas described in the standard would therefore be suitable for manufacturer testing. To make this point clearer, and to use a more readily available reference point, the standards been reworded to specify a gas that "has a flame temperature equivalent to that of natural gas."

The dimensions of the enclosure within which the test is conducted have been changed from those proposed, in order to provide more draft-free conditions, and consequently more repeatable results. Smaller cabinets, furthermore, evidently are more generally available than larger ones. Again it should be noted that there is no necessity that manufacturers duplicate the dimensions of the test cabinet, as long as they can establish a reasonable basis for concluding that their materials will meet the requirements when tested in such a cabinet.

Several comments questioned the need for specifying the temperature and relative humidity under which the material is conditioned and the test is conducted. The foregoing discussions of the relation of the standard to manufacturer testing apply here also. The specification of temperature and relative humidity for conditioning and testing is made to preclude any arguments, in the face of a compliance test failure, that variations in test results are due to permitted variations in test conditions. The relative humidity specification has been changed from 65 percent, as proposed, to 50 percent. This humidity level represents more closely the conditions encountered in use during fairly dry weather. While it is a slightly more stringent condition, it is one in wide use for materials testing, according to the comments, and is not, in the judgment of the Bureau, a large enough change in the substance of the proposal to warrant further notice and opportunity for comment.

Several comments suggested that the standard should specify the number of specimens to be tested, with averaging of results, as is commonly found in specification-type standards. The legal nature of the motor vehicle safety standards is such, however, that sampling and averaging provisions would be inappropriate. As defined by the National Traffic and Motor Vehicle Safety Act, the standards are minimum performance levels that must be met by every motor vehicle or item of motor vehicle equipment to which they apply. Enforcement is based on independent Bureau testing, not review of manufacturer testing, and manufacturers are required to take legal responsibility for every item they produce. The result, and the intent of the Bureau in setting the standards, is that manufacturers must establish a sufficient margin of performance between their test results and the standard's requirements to allow for whatever variances may occur between items tested and items produced.

The description of portions to be tested has been changed slightly, such that the surface and the underlying materials are tested either separately or as a composite, depending on whether they are attached to each other as used in the vehicle. In the proposal, surface and underlying materials were to be tested separately regardless of how used, an element of complexity found unnecessary for safety purposes.

In response to comments with respect to materials that burn at a decreasing rate, to which the application of the test is not clear, an additional criterion has been added. If material stops burning before it has burned for 60 seconds, and does not burn more than 2 inches, it is considered to meet the requirement.

In consideration of the foregoing, § 571.21 of Title 49, Code of Federal Regulations, is amended by the addition of Standard No. 302, Flammability of Interior Materials.

*Effective date:* September 1, 1972. Because of the extensive design changes that will be necessitated by this new standard, and the lead-time consequently required by manufacturers to prepare for production, it is found, for good

Effective: September 1, 1972

cause shown, that an effective date later than one year from the issuance of this notice is in the public interest.

Issued on December 29, 1970.

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Douglas W. Toms  
Director

36 F.R. 289

January 8, 1971





## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 302

### Flammability of Interior Materials

(Docket No. 3-3; Notice 7b)

This notice modifies the test procedures and specimen preparation requirements of Motor Vehicle Safety Standard No. 302, *Flammability of interior materials* (49 CFR 571.302). A notice of proposed rulemaking was issued on May 17, 1973 (38 FR 12934).

Several comments on the notice of proposed rulemaking suggested exempting small components on the basis of size because of the confusion caused by paragraph S4.1. This agency has not found, however, that the exemption of a component on the basis of size is consistent with safety. Rather, NHTSA finds that if a component is too small to produce an acceptable test sample, a test sample consisting of the material from which the component is fabricated should be substituted. Consequently, a new section S4.1.1 has been added to require surrogate testing of such components as switches, knobs, gaskets, and grommets which are considered too small to be effectively tested under the current procedures.

A previous notice of proposed rulemaking (36 FR 9565) suggested a scheme for testing single and composite materials that would allow the testing of certain configurations of vehicle interior materials not taken into account under the present scheme. Examples of such configurations are multi-layered composites and single layers of underlying materials that are neither padding nor cushioning materials. Comments to that notice argued that some aspects of the proposed scheme would require some duplicative testing without providing a measurable safety benefit.

In response to these arguments, it was proposed (38 F.R. 12934) that S4.2 be amended to take into account some omissions in the present

scheme and to reduce the complexity of testing single and composite materials. After reviewing the comments, the proposed scheme is adopted. Thus, the standard is amended to require single materials or composites (materials that adhere at every point of contact), any part of which is within  $\frac{1}{2}$  inch of the surface of the component, to meet the burn-rate requirements. Materials that are not part of adhering composites are subject to the requirements when tested separately. Those materials that do adhere to adjacent materials at every point of contact are subject to the requirements as composites when tested with the adjacent materials. The concept of "adherence" would replace language presently contained in the standard describing materials as "bonded, sewed, or mechanically attached." An illustrative example is included in the text of the section.

Several comments in response to the notice of proposed rulemaking requested changes in the test cabinet, as did comments in response to previous notices concerning this standard. The NHTSA has evaluated various recommendations and suggestions concerning the cabinet. No changes are proposed in this notice, however, as sufficient justification has not been found for a design change at this time.

Paragraph S5.2.1 of the standard presently provides that materials exceeding  $\frac{1}{2}$  inch in thickness are to be cut down to  $\frac{1}{2}$  inch in thickness before testing. As described in the notice of proposed rulemaking, cutting certain materials to the prescribed thickness produces a tufted surface upon which a flame front may be propagated at a faster rate than it would be upon the surface of the material before cutting, thereby creating an artificial test condition. In order

Effective: October 1, 1975

to avoid this, the requirements for the transmission rate of a flame front are amended in S4.3(a) to exclude surfaces created by cutting.

The notice of proposed rulemaking points out that a related problem has arisen concerning which surfaces of a test specimen should face the flame in the test cabinet. To answer this question and avoid unnecessary test duplication, the test procedures are amended to provide that the surface of the specimen closest to the occupant compartment air space face downward on the test frame. The test specimen is produced by cutting the material in the direction that provides the most adverse test results.

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In light of the above, Motor Vehicle Safety Standard No. 302, 49 CFR § 571.302, is amended. . . .

*Effective date:* Oct. 1, 1975.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on March 17, 1975.

James B. Gregory  
Administrator

**40 F.R. 14318**  
**March 31, 1975**

# PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 302

## Flammability of Interior Materials

(Docket No. 3-3; Notice 9)

On March 31, 1975, the National Highway Traffic Safety Administration (NHTSA) issued a notice modifying the test procedures and specimen preparation requirements of Motor Vehicle Safety Standard No. 302, 49 CFR 571.302, *Flammability of interior materials* (40 FR 14318). Petitions for reconsideration of the rule were received from American Motors Corporation, General Motors Corporation, White Motor Corporation, Chrysler Corporation, Volkswagen of America, Inc., Toyota Motor Sales, U.S.A., Inc., Ford Motor Company, and the Motor Vehicle Manufacturers Association of the United States, Inc.

The NHTSA notice established a process of surrogate testing for components which were too small to test without difficulty using the procedures previously prescribed by Standard No. 302. The objections raised to this new process by the petitioners were that (a) the surrogate testing procedure is an entirely new departure, and the public should have been afforded an opportunity for comment, (b) the results of surrogate testing will in certain cases differ from the results of testing the actual component, (c) the creation of a surrogate testing sample of certain materials, such as elastic cord, is impossible, and (d) the dimensions of the surrogate sample are inappropriate.

It should be fully understood that small components which would otherwise be included within the purview of Standard No. 302 are not excluded by virtue of their size. Further, the NHTSA intends to utilize a surrogate testing procedure, among other testing procedures, in the case of small components as the first step in determining whether a safety defect exists pursuant to section 152 of the National Traffic and

Motor Vehicle Safety Act. Since the testing of small components is a more difficult process, the NHTSA concluded in amending Standard No. 302 to include the surrogate testing process that the new requirement was less stringent than that currently required by the standard. Further, by amending the standard the industry could also be fully apprised of one of the methods the NHTSA intended to use to determine whether a section 152 defect existed.

Nonetheless, it appears from the petitions for reconsideration which were received that a number of manufacturers feel that they should be allowed an opportunity for comment. The NHTSA concludes their request is reasonable and the rule, as it relates to surrogate testing, is hereby revoked and is reissued as a notice of proposed rulemaking in this issue of the *FEDERAL REGISTER*.

A number of the petitioners questioned the need for including any small components within the ambit of Standard No. 302, citing the notice of proposed rulemaking (38 FR 12934, May 17, 1973) which stated that certain small components designed to absorb energy are not fire hazards. Therefore, the petitioners believe the NHTSA has reversed its previous position.

This understanding is correct. As the NHTSA said in the preamble to the proposed amendment to Standard No. 302, issued concurrently with the amendment to the Standard (March 31, 1975, 40 FR 14340):

On May 11, 1973, the NHTSA issued a notice (38 FR 12934) which proposed, *inter alia*, amending paragraph S4.1 of Standard No. 302 to enumerate the interior components of vehicle occupant compartment which fell within the ambit of the standard.

\* \* \* \* \*



Comments to the notice, however, have made clear that the enumeration of components, even with the proposed amendment, will continue to confuse manufacturers required to meet the standard.

\* \* \* \* \*

While some materials exposed to the occupant compartment air space are not fire hazards, the burden of ascertaining that fact should properly lie with the manufacturer.

Several petitions also questioned what safety benefits would come from applying the standard to small components. As petitioner American Motors pointed out, the purpose of Standard No. 302 is to provide sufficient time for the occupants of a vehicle to exit in case of an interior fire. Thus, even small components which are highly flammable would hasten the spreading of fires in motor vehicles, resulting in a serious hazard.

*Testing procedures.* Petitioners pointed out that while the preamble provides that the surface of the specimen closest to the occupant compartment air space face downward on test frame, this is not made entirely clear in the body of the standard itself. The standard is amended to clarify this matter. Likewise, a definition of the term "occupant compartment air space" is added, although this term was used in the notice of proposed rulemaking without raising a problem for those commenting.

*Extension of effective date of amendment.* Several petitioners asked for an extension of the effective date. As the surrogate testing procedures have been revoked and reissued as a proposed rule, the NHTSA concludes that an extension of the effective date is not necessary.

*Redesignation of Docket 3-3; Notice 7.* Through a clerical error, two notices were issued with the heading, "Docket 3-3; Notice 7" (July 11, 1973, 38 FR 18564; March 31, 1975, 40 FR 14318). The notice appearing at 38 FR 18564 is hereby redesignated "Notice 7a" and that appearing at 49 FR 14318 is redesignated "Notice 7b."

In consideration of the foregoing, Motor Vehicle Safety Standard No. 302, 49 CFR 571.302, is amended. . . .

*Effective date:* September 16, 1975.

Because this amendment relieves a restriction, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on September 10, 1975.

James B. Gregory  
Administrator

September 16, 1975  
40 F.R. 42746

## PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 302

### Flammability of Interior Materials

(Docket No. 3-3; Notice 11)

This notice establishes a new section, S3A. *Definitions*, in Motor Vehicle Safety Standard No. 302, 49 CFR 571.302.

On September 16, 1975, the NHTSA published in the Federal Register its response to a petition for reconsideration of Motor Vehicle Safety Standard No. 302, *Flammability of interior materials* (40 FR 42746). The rule established a definition of the term "occupant compartment air space" that was supposed to be added to "S3A. *Definitions*." The wording of the amendment was faulty, however, since the Definitions section had not yet been established in Standard No. 302. This notice corrects the error by adding that section to the standard.

Petitions have been received from General Motors Corporation, Motor Vehicle Manufacturers Association, American Motors Corporation, and Ford Motor Company requesting that the definition of "occupant compartment air space" in Notice 9 be revoked. These petitions will be addressed in a separate notice. The purpose of

this notice is only to promulgate the section heading which was omitted in error from Notice 9.

In light of the above, in place of the amendment numbered 1. in Docket 3-3, Notice 9 (40 FR 42746, September 16, 1975), Motor Vehicle Safety Standard No. 302 is amended by adding a new S3A. *Definitions*. . . .

Effective date: December 4, 1975. Because this amendment is of an interpretative nature and makes no substantive change in the rule, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119 Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at CFR 1.51)

Issued on November 28, 1975.

James B. Gregory  
Administrator

40 F.R. 56667  
December 4, 1975





## MOTOR VEHICLE SAFETY STANDARD NO. 302

### Flammability of Interior Materials—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

(Docket N. 3-3; Notice 4)

**S1. Scope.** This standard specifies burn resistance requirements for materials used in the occupant compartments of motor vehicles.

**S2. Purpose.** The purpose of this standard is to reduce the deaths and injuries to motor vehicle occupants caused by vehicle fires, especially those originating in the interior of the vehicle from sources such as matches or cigarettes.

**S3. Application.** This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

#### S3A. Definitions.

“Occupant compartment air space” means the space within the occupant compartment that normally contains refreshable air. (40 F.R. 42746—September 16, 1975. Effective 9/16/75. 40 F.R. 56667—December 4, 1975. Effective: 12/4/75)

#### S4. Requirements.

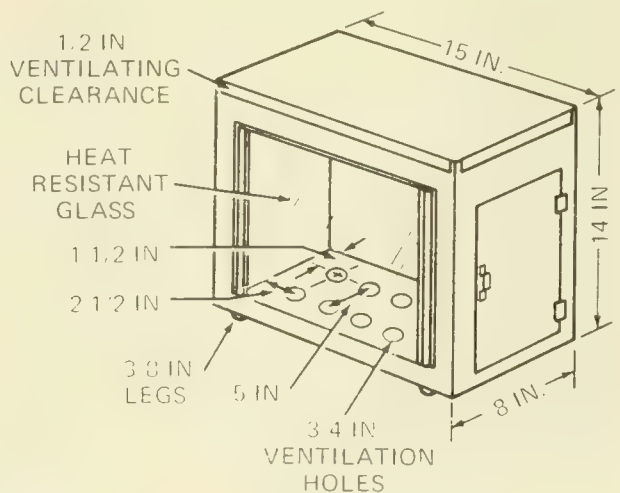
**S4.1** The portions described in S4.2 of the following components of vehicle occupant compartments shall meet the requirements of S4.3: Seat cushions, seat backs, seat belts, headlining, convertible tops, arm rests, all trim panels including door, front, rear, and side panels, compartment shelves, head restraints, floor coverings, sun visors, curtains, shades, wheel housing covers, engine compartment covers, mattress covers, and any other interior materials, including padding and crash-deployed elements, that are designed to absorb energy on contact by occupants in the event of a crash.

**S4.1.1** Deleted and Reserved.

**S4.2** Any portion of a single or composite material which is within  $\frac{1}{2}$  inch of the occupant compartment air space shall meet the requirements of S4.3.

**S4.2.1** Any material that does not adhere to other material(s) at every point of contact shall meet the requirements of S4.3 when tested separately.

**S4.2.2** Any material that adheres to other material(s) at every point of contact shall meet the requirements of S4.3 when tested as a composite with the other material(s). Material A has a non-adhering interface with material B and is tested separately. Part of material B is within  $\frac{1}{2}$  inch of the occupant compartment air space, and materials B and C adhere at every point of contact; therefore B and C are tested as a composite. The cut is in material C as shown, to make a specimen  $\frac{1}{2}$  inch thick.



**S4.3(a)** When tested in accordance with S5, material described in S4.1 and S4.2 shall not burn, nor transmit a flame front across its surface, at a rate of more than 4 inches per minute. However, the requirement concerning transmission of a flame front shall not apply to a surface created by the cutting of a test specimen for purposes of testing pursuant to S5.

(b) If a material stops burning before it has burned for 60 seconds from the start of timing, and has not burned more than 2 inches from the point where timing was started, it shall be considered to meet the burn-rate requirement of S4.3(a).

## **S5. Test procedure.**

### **S5.1 Conditions.**

**S5.1.1** The test is conducted in a metal cabinet for protecting the test specimens from drafts. The interior of the cabinet is 15 inches long, 8 inches deep, and 14 inches high. It has a glass observation window in the front, a closable opening to permit insertion of the specimen holder, and a hole to accommodate tubing for a gas burner. For ventilation, it has a ½-inch clearance space around the top of the cabinet, ten ¾-inch-diameter holes in the base of the cabinet, and legs to elevate the bottom of the cabinet by three-eighths of an inch, all located as shown in Figure 1.

**S5.1.2** Prior to testing, each specimen is conditioned for 24 hours at a temperature of 70° F. and a relative humidity of 50 percent, and the test is conducted under those ambient conditions.

**S5.1.3** The test specimen is inserted between two matching U-shaped frames of metal stock 1 inch wide and three-eighths of an inch high. The interior dimensions of the U-shaped frames are 2 inches wide by 13 inches long. A specimen that softens and bends at the flaming end so as to cause erratic burning is kept horizontal by supports consisting of thin, heat resistant wires, spanning the width of the U-shaped frame under the specimen at 1-inch intervals. A device that may be used for supporting this type of material is an additional U-shaped frame, wider

than the U-shaped frame containing the specimen, spanned by 10-mil wires of heat-resistant composition at 1-inch intervals, inserted over the bottom U-shaped frame.

**S5.1.4** A bunsen burner with a tube of ⅜-inch inside diameter is used. The gas adjusting valve is set to provide a flame, with the tube vertical, of 1½ inches in height. The air inlet to the burner is closed.

**S5.1.5** The gas supplied to the burner has a flame temperature equivalent to that of natural gas.

### **S5.2 Preparation of specimens.**

**S5.2.1** Each specimen of material to be tested shall be a rectangle 4 inches wide by 14 inches long, wherever possible. The thickness of the specimen is that of the single or composite material used in the vehicle, except that if the material's thickness exceeds ½ inch, the specimen is cut down to that thickness measured from the surface of the specimen closest to the occupant compartment air space. Where it is not possible to obtain a flat specimen because of surface curvature, the specimen is cut to not more than ½ inch in thickness at any point. The maximum available length or width of a specimen is used where either dimension is less than 14 inches or 4 inches, respectively, unless surrogate testing is required under S4.1.1.

**S5.2.2** The specimen is produced by cutting the material in the direction that provides the most adverse test results. The specimen is oriented so that the surface closest to the occupant compartment air space faces downward on the test frame.

**S5.2.3** Material with a napped or tufted surface is placed on a flat surface and combed twice against the nap with a comb having seven to eight smooth, rounded teeth per inch.

### **S5.3 Procedure.**

(a) Mount the specimen so that both sides and one end are held by the U-shaped frame, and one end is even with the open end of the frame. Where the maximum available width of a speci-

men is not more than 2 inches, so that the sides of the specimen cannot be held in the U-shaped frame, place the specimen in position on wire supports as described in S5.1.3, with one end held by the closed end of the U-shaped frame.

(b) Place the mounted specimen in a horizontal position, in the center of the cabinet.

(c) With the flame adjusted according to S5.1.4, position the bunsen burner and specimen so that the center of the burner tip is three-fourths of an inch below the center of the bottom edge of the open end of the specimen.

(d) Expose the specimen to the flame for 15 seconds.

(e) Begin timing (without reference to the period of application of the burner flame) when the flame from the burning specimen reaches a point  $1\frac{1}{2}$  inches from the open end of the specimen.

(f) Measure the time that it takes the flame to progress to a point  $1\frac{1}{2}$  inches from the clamped end of the specimen. If the flame does not reach the specified end point, time its progress to the point where flaming stops.

(g) Calculate the burn rate from the formula

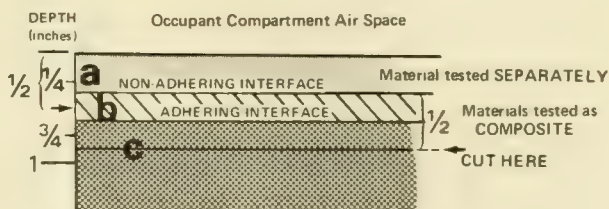
$$B = 60 \times \frac{D}{T}$$

Where B = burn rate in inches per minute,

D = length the flame travels in inches, and

T = time in seconds for the flame to travel D inches.

Illustrative Example



36 F.R. 289  
January 8, 1971





### **Section Three**

**Part 571—Notice of Ruling Regarding Chassis-Cabs  
Notice of Ruling Regarding Campers  
Slide-In and Chassis-Mount**

**Part 572—Anthropomorphic Test Dummy**

**Part 573—Defect Reports**

**Part 574—Tire Identification and Recordkeeping Tire Code Marks**

**Part 575—Consumer Information**

**Part 576—Record Retention**

**Part 577—Defect Notification**

**Part 579—Defect and Noncompliance Responsibility**

**Part 580—Odometer Disclosure Requirements**

**Part 581—Bumper Standard**

**Part 582—Insurance Cost Information Regulations**

**Part 590—Emission Inspections**

**Department of the Treasury Regulation Relating to Importation of  
Motor Vehicles and Items of Motor Vehicle Equipment**





## **MOTOR VEHICLE SAFETY STANDARDS**

### **Notice of Ruling Regarding Chassis-Cabs**

Inquiry has been received from persons engaged in the sale of trucks, buses, and multi-purpose vehicles regarding their legal responsibility under the National Traffic and Motor Vehicle Safety Act of 1966 for assuring that vehicles sold by them are in conformity with all applicable motor vehicle safety standards. Such persons commonly purchase chassis-cabs from manufacturers and bodies or work-performing and load-carrying structures from other manufacturers and then combine the chassis-cab with the body or other structure. A regulation is being issued this date by the Federal Highway Administration defining the chassis-cab as a vehicle within the meaning of the Act, requiring that it meet all motor vehicle safety standards applicable on the date of manufacture of the chassis-cab.<sup>1</sup> Under this regulation the manufacturer of a chassis-cab manufactured subsequent to January 1, 1968, will have responsibility for compliance with all applicable motor vehicle safety standards as set forth therein and for certification of such compliance to distributors and dealers.

Section 101(5) of the National Traffic and Motor Vehicle Safety Act defines a "manufacturer" as any person engaged in the "assembling" of motor vehicles. Persons who combine chassis-cabs with bodies or similar structures are, therefore, manufacturers within the meaning of the Act. Inasmuch as the chassis-cab's manufacturer is responsible for compliance with standards under the regulation issued today, persons who add bodies or other structures to such chassis-cab are not considered manufacturers of the chassis-cab and, therefore, will not be responsible for the conformance of the chassis-cab to the standards certified by the manufacturer of the

chassis-cab. In numerous instances the chassis-cab will not be capable of complying with motor vehicle safety standard 108 because it will not be equipped with all items of lighting equipment referred to in such standard. Where vendors combine a chassis-cab which has not been certified to be in conformance with standard 108, with a body or other like structure, such vendor will be responsible for compliance with the lighting standard, and where such vendor sells the combined assemblage to another vendor, certification of compliance with the lighting standard must accompany the vehicle.

We are advised that a substantial inventory of chassis-cabs manufactured prior to the effective date of the initial motor vehicle safety standards and hence not required to comply with the same will be held by manufacturers, distributors, and dealers on January 1, 1968. These vehicles may contain various items of lighting equipment manufactured prior to the effective date of the lighting standard or be designed to accept such equipment. Under these circumstances, it does not appear appropriate to require compliance with the lighting standard when such chassis-cabs, i.e., those manufactured prior to January 1, 1968, are combined with bodies or similar structures. Section 108(a)(1) of the Act also prohibits any person from manufacturing for sale or selling any motor vehicle manufactured "after the date any applicable Federal motor vehicle safety standard takes effect under this title unless it is in conformity with such standard \*\*\*." Under this provision persons who combine the chassis-cab with a body or other structure will be responsible for (1) compliance of the combined assemblage with any motor vehicle safety standard applicable to the end use of the combined assemblage in effect on the date of manufacture of the chassis-cab, compliance with which has not already been certified

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<sup>1</sup> See F.R. Doc. 67-15174, Title 23, in Rules and Regulations Section, supra.

by the chassis-cab manufacturer, and (2) compliance with all applicable standards in effect on the date of manufacturer of the chassis-cab to the extent that the addition of a body or other structure to the chassis-cab affects the chassis-cab's previous conformance with applicable standards.

To insure that the person combining the chassis-cab with the body or other structure has adequate information to enable him to meet the conditions specified above, the regulation being issued concurrently with this ruling requires the

chassis-cab manufacturer to affix a label to the chassis-cab which identifies the Federal motor vehicle safety standards with which the chassis-cab fully complies for the principal end uses of such chassis-cab.

Issued in Washington, D.C., on December 29, 1967.

Lowell K. Bridwell,  
Federal Highway Administrator

**33 F.R. 29**  
**January 3, 1968**

**FEDERAL MOTOR VEHICLE SAFETY STANDARDS**  
**(FHWA Ruling 68-1)**

**Notice of Ruling Regarding Campers Slide-in and Chassis-Mount**

This ruling is in response to inquiries for a clarification of the applicability of Federal Motor vehicle safety standards to certain items of motor vehicle equipment commonly known as "campers" which are used mostly for recreational purposes.

A "camper" can be described generally as a portable structure designed to be loaded onto, or affixed to, a motor vehicle to provide temporary living quarters for recreation, travel, or other use. The ruling is concerned with two general categories of campers. The first, a "slide-in camper", is placed on, or slides onto a completed vehicle, usually a pickup truck. The second, a "chassis-mount camper", is mounted on a chassis-cab.

In past months the Bureau received a number of written inquiries regarding the applicability of the glazing material standard (No. 205) to slide-in campers. These persons received responses from the Bureau indicating that slide-in campers would have to comply with standard 205 under certain specified conditions. These responses of the Bureau apparently received widespread dissemination in the industry. Subsequently, additional inquiries were received from affected persons asking for clarification of the Bureau's earlier responses with respect to the question of whether standard 205 was applicable to glazing materials contained in slide-in campers sold by the manufacturer of such campers to members of the public and to dealers when not an integral part of the vehicle.

The Bureau has reconsidered this question and determined that the glazing standard is applicable to slide-in campers.

Standard 205 is applicable to "glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks and buses."

The slide-in camper is an item of motor vehicle equipment for use in motor vehicles. As such, glazing materials contained in slide-in campers must comply with standard 205 when such campers are sold as a separate unit as well as when attached to a completed pickup truck. Additionally, manufacturers of slide-in campers must also comply with the certification requirements set forth in section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1403).

Review of the Bureau's prior communications with affected persons indicates that such persons, and others who received notice of such communications, could justifiably have concluded that standard 205 was subject to an interpretation which excluded its application to slide-in campers sold directly to consumers or to dealers when not an integral part of the pickup truck. In these circumstances the Bureau does not regard it as appropriate that the interpretation of the applicability of standard 205, which this ruling announces, should be given retroactive effect. Further, in view of such reliance a reasonable time should be afforded affected parties to allow for possible necessary production adjustments. Accordingly, it is determined that with respect to slide-in campers, the interpretation announced by this ruling shall not become effective until July 1, 1968.

With regard to the chassis-mount camper, it is an integral part of the vehicle when attached to a chassis-cab as defined in § 371.3(b), Part 371, Federal Motor Vehicle Safety Standards (33 F.R. 19).

Persons who mount the chassis-mount camper to the chassis-cab are manufacturers of vehicles within the meaning of section 102(3) of the National Traffic and Motor Vehicle Safety Act



of 1966 (15 U.S.C. 1392). As such, they are to be guided by the regulation and ruling on chassis-cabs issued December 29, 1967 (33 F.R. 19 and 33 F.R. 29). Under this regulation and ruling persons combining a chassis-cab manufactured on or after January 1, 1968, with a body or like structure (in this case the chassis-mount camper) are responsible for assuring that the completed assemblage complies with all applicable standards in effect on the date of manufacture of the chassis-cab which had not previously been met

by the manufacturer of the chassis-cab, and for assuring that previously met standards have not been adversely affected by the addition of the chassis-mount camper.

Issued in Washington, D.C., on March 20, 1968.

Lowell K. Bridwell,  
Federal Highway Administrator

**33 F.R. 5020**  
**March 26, 1968**

## PREAMBLE TO PART 572—ANTHROPOMORPHIC TEST DUMMY

(Docket No. 73-8; Notice 2)

The purposes of this notice are (1) to adopt a regulation that specifies a test dummy to measure the performance of vehicles in crashes, and (2) to incorporate the dummy into Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208), for the limited purpose of evaluating vehicles with passive restraint systems manufactured under the first and second restraint options between August 15, 1973, and August 15, 1975. The question of the restraint system requirements to be in effect after August 15, 1975, is not addressed by this notice and will be the subject of future rulemaking action.

The test dummy regulation (49 CFR Part 572) and the accompanying amendment to Standard No. 208 were proposed in a notice published April 2, 1973 (38 F.R. 8455). The dummy described in the regulation is to be used to evaluate vehicles manufactured under sections S4.1.2.1 and S4.1.2.2, (the first and second options in the period from August 15, 1973, to August 15, 1975), and the section incorporating the dummy is accordingly limited to those sections. The dummy has not been specified for use with any protection systems after August 15, 1975, nor with active belt systems under the third restraint option (S4.1.2.3). The recent decision in *Ford v. NHTSA*, 473 F. 2d 1241 (6th Cir. 1973), removed the injury criteria from such systems. To make the dummy applicable to belts under the third option, the agency would have to provide additional notice and opportunity for comment.

By invalidating the former test dummy specification, the decision in *Chrysler v. DOT*, 472 F. 2d 659 (6th Cir. 1972), affected the restraint options in effect before August 15, 1975, as well as the mandatory passive restraint requirements that were to be effective after that date. A manufacturer who built cars with passive

restraints under one of the options would therefore be unable to certify the cars as complying with the standard, as illustrated by the necessity for General Motors to obtain a limited exemption from the standard in order to complete the remainder of a run of 1,000 air-bag equipped cars.

The immediate purpose of this rulemaking is to reconstitute those portions of the standard that will enable manufacturers to build passive restraint vehicles during the period when they are optional. The test dummy selected by the agency is the "GM Hybrid II", a composite developed by General Motors largely from commercially available components. GM had requested NHTSA to adopt the Hybrid II on the grounds that it had been successfully used in vehicle tests with passive restraint systems, and was as good as, or better than, any other immediately available dummy system. On consideration of all available evidence, the NHTSA concurs in this judgment. One fact weighing in favor of the decision is that General Motors has used this dummy to measure the conformity of its vehicles to the passive protection requirements of Standard 208, in preparation for the announced introduction of up to 100,000 air-bag-equipped vehicles during the 1974 model year.

No other vehicle manufacturer has announced plans for the production of passive restraint systems during the optional phase, nor has any other vehicle manufacturer come forward with suggestions for alternatives to Hybrid II. The NHTSA would have considered other dummies had some other manufacturer indicated that it was planning to produce passive restraint vehicles during the option period and that some other dummy had to be selected in order to allow them to proceed with their plans. If there had

been any such plans, NHTSA would have made every effort to insure that a test device satisfactory to said manufacturer would have been selected.

This agency recognizes that since various types of dummy systems have been in use under the previous specification, any selection of one dummy, as is required by the *Chrysler* decision, will necessitate readjustments by some manufacturers. However, considering the quantity of GM's production, the scope and advanced state of its passive restraint development program, and the fact that the Hybrid II does not differ radically from other dummies currently in use, in the NHTSA's judgment that dummy represents the best and least costly choice. That conclusion has not been contradicted by the comments to the docket.

The agency will not make any final decision regarding reinstatement of mandatory passive restraint requirements without further notice and opportunity for comment. Should the agency propose mandatory passive restraint requirements, the question of the conformity of the dummy that is chosen with the instructions of the court in *Chrysler* will again be open for comment. The NHTSA strongly encourages the continuance of the dummy test programs mentioned in the comments, in the hope that any problems that may arise can be identified and resolved before the dummy specifications for later periods are issued.

The Hybrid II dummy has been found by NHTSA to be a satisfactory and objective test instrument. In sled and barrier tests conducted by GM with the GM restraint systems and in sled tests conducted by Calspan Corp. on behalf of NHTSA, the Hybrid II has produced results that are consistent and repeatable. This is not to say that each test at the same nominal speed and deceleration has produced identical values.

In testing with impact sleds, and to an even greater extent with crash-tested vehicles, the test environment itself is complex and necessarily subject to variations that affect the results. The test data show, however, that the variance from dummy to dummy in these tests is sufficiently small that a manufacturer would have no difficulty in deciding whether his vehicle would be likely to fail if tested by NHTSA.

The provisions of the dummy regulation have been modified somewhat from those proposed in the notice of proposed rulemaking, largely as a result of comments from GM. Minor corrections have been made in the drawings and materials specifications as a result of comments by GM and the principal dummy suppliers. The dummy specification, as finally adopted, reproduces the Hybrid II in each detail of its design and provides, as a calibration check, a series of performance criteria based on the observed performance of normally functioning Hybrid II components. The performance criteria are wholly derivative and are intended to filter out dummy aberrations that escape detection in the manufacturing process or that occur as a result of impact damage. The revisions in the performance criteria, as discussed hereafter, are intended to eliminate potential variances in the test procedures and to hold the performance of the Hybrid II within the narrowest possible range.

General Motors suggested the abandonment of the definition of "upright position" in section 572.4(c), and the substitution of a set-up procedure in section 572.11 to serve both as a positioning method for the performance tests and as a measurement method for the dummy's dimensions as shown in the drawings. The NHTSA does not object to the use of an expanded set-up procedure, but has decided to retain the term "upright position" with appropriate reference to the new section 572.11(i).

The structural properties test of section 572.5(c), which had proposed that the dummy keep its properties after being subjected to tests producing readings 25 percent above the injury criteria of Standard No. 208, has been revised to provide instead that the properties must be retained after vehicle tests in accordance with Standard No. 208.

The head performance criteria are adopted as proposed. The procedures have been amended to insure that the forehead will be oriented below the nose prior to the drop, to avoid interference from the nose. In response to comments by the Road Research Laboratory, American Motors, and GM, an interval of at least 2 hours between tests is specified to allow full restoration of compressed areas of the head skin.



The neck performance criteria are revised in several respects, in keeping with GM's recommendations. The pendulum impact surface, shown in Figure 4, has been modified in accordance with GM's design. The zero time point has been specified as the instant the pendulum contacts the honeycomb, the instructions for determining chordal displacement have been modified, and the pulse shape of the pendulum deceleration curve has been differently specified. The maximum allowable deceleration for the head has been increased slightly to 26g. In response to suggestions by the Road Research Laboratory and the Japan Automobile Manufacturers Association (JAMA), as well as GM, a tolerance has been specified for the pendulum's impact velocity to allow for minor variances in the honeycomb material.

With respect to the thorax test, each of the minor procedural changes requested by GM has been adopted. As with the head, a minimum recovery time is specified for the thorax. The seating surface is specified in greater detail, and the test probe orientation has been revised to refer to its height above the seating surface. The test probe itself is expressly stated to have a rigid face, by amendment to section 572.11, thereby reflecting the probes actually used by NHTSA and GM. A rigid face for the probe was also requested by Mercedes Benz.

The test procedures for the spine and abdomen tests are specified in much greater detail than before, on the basis of suggestions by GM and others that the former procedures left too much room for variance. The test fixtures for the spinal test orientation proposed by GM, and its proposed method of load application have been adopted. The parts of the dummy to be assembled for these tests are specifically recited, and an initial 50° flexion of the dummy is also specified. The rates of load application and removal, and the method of taking force readings are each specified. The direction of force application is clarified in response to a comment by Volvo.

The abdomen test is amended with respect to the initial point of force measurement, to resolve a particular source of disagreement between GM's data and NHTSA's. The boundaries of

the abdominal force-deflection curve are modified to accord with the measurements taken by GM subsequent to the issuance of the notice. The rate of force application is specified as not more than 0.1 inch per second, in response to comments by Mercedes Benz, JAMA, and GM.

The test procedures for the knee tests are revised to specify the type of seating surface used and to control the angle of the lower legs in accordance with suggestions by JAMA, the Road Research Laboratory, and GM. The instrumentation specifications of section 572.11 are amended to clarify the method of attachment and orientation of the thorax accelerometers and to specify the channel classes for the chest potentiometer, the pendulum accelerometer, and the test probe accelerometer, as requested by several comments.

The design and assembly drawings for the test dummy are too cumbersome to publish in the *Federal Register*. During the comment period on the April 2 notice, the agency maintained master copies of the drawings in the docket and placed the reproducible mylar masters from which the copies were made with a commercial blueprint facility from whom interested parties could obtain copies. The NHTSA has decided to continue this practice and is accordingly placing a master set of drawings in the docket and the reproducible masters for these drawings with a blueprint facility.

The drawings as adopted by this notice differ only in minor detail from those that accompanied the April 2 notice. The majority of the changes, incorporated into corrected drawings, have already been given to those persons who ordered copies. The letter of June 13, 1973, that accompanied the corrected drawings has been placed in the docket. The June corrections are incorporated into the final drawing package. Additional adjustments are made hereby to reflect better the weight distribution of separated segments of the dummy, to allow other materials to be used for head ballast, and to specify the instrument for measuring skin thickness. The details of these changes are recited in a memorandum incorporated into the drawing package.

Each of the final drawings is designated by the legend "NHTSA Release 8/1/73". Each

drawing so designated is hereby incorporated as part of the test dummy specifications of 49 CFR Part 572. Subsequent changes in the drawings will not be made without notice and opportunity for comment.

The incorporation of the Part 572 test dummy into Standard No. 208 makes obsolete several test conditions of the standard that had been adopted to supplement the former test dummy specifications. The location, orientation, and sensitivity of test instrumentation formerly specified by sections S8.1.15 through S8.1.18 are now controlled by Part 572 and are no longer necessary within Standard No. 208. Similarly, the use of rubber components for the head, neck and torso joints as specified in Part 572, supplant the joint setting specifications for those joints in section S8.1.10 of the standard. The NHTSA has determined that the deletion of the above portions of the Standard No. 208 will have no effect on the substantive requirements of the standard and that notice and public procedure thereon are unnecessary.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by the addition of Part 572, Anthropomorphic Test Dummy. . . .

In view of the pressing need for a test dummy to permit the continued development of passive restraint systems, and the fact that it presently only relates to a new option for compliance, the NHTSA finds that there is good cause to adopt an immediate effective date. Accordingly, Part 572 is effective August 1, 1973, and the amendment to Standard 208 is effective August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, P.L. 89-563, 15 U.S.C. 1392, 1407, and the delegation of authority at 38 F.R. 12147.

Issued on July 26, 1973.

James E. Wilson  
Associate Administrator  
Traffic Safety Programs

**38 F.R. 20449**  
**August 1, 1973**

## PREAMBLE TO AMENDMENT TO PART 572—ANTHROPOMORPHIC TEST DUMMIES

(Docket No. 73-8; Notice 4)

This notice amends Part 572, *Anthropomorphic Test Dummy*, to specify several elements of the dummy calibration test procedures and make minor changes in the dummy design specifications. Part 572 is also reorganized to provide for accommodation of dummies other than the 50th-percentile male dummy in the future.

Part 572 (49 CFR Part 572) establishes, by means of approximately 250 drawings and five calibration tests, the exact specifications of a test device that simulates an adult occupant of a motor vehicle, for use in evaluating certain types of crash protection systems provided in accordance with Standard No. 208, *Occupant Crash Protection* (49 CFR § 571.208). Interested persons are advised that NHTSA Docket Nos. 69-7 and 74-14 concerning Standard No. 208 are related to this rulemaking.

Proposed occupant protection requirements in Standard No. 208 were reviewed by the Sixth Circuit in 1972 (*Chrysler v. Department of Transportation*, 472 F. 2d 659 (6th Cir. 1972)), and the dummy previously specified for use in testing was invalidated as insufficiently objective. The NHTSA subsequently established new dummy specifications under Part 572 for the limited purpose of qualifying passive restraint systems which manufacturers choose to offer on an optional basis (38 FR 20499, August 1, 1973). After examining test experience with the Part 572 dummy, the NHTSA specified its use in a proposal to mandate passive restraint systems (39 FR 10271, March 19, 1974).

Recently, the agency proposed minor changes in calibration procedures and dummy drawings (40 FR 33462, August 8, 1975) in response to the comments of manufacturers and others on the March 1974 notice. The August 1975 proposal only addressed the issue of dummy objectivity

raised by the Sixth Circuit, while issues of dummy similarity to humans, sensitivity to test environment, and dummy positioning in a vehicle have been treated elsewhere (41 FR 29715, July 19, 1976).

It is noted that the most recent Department of Transportation proposals on Standard No. 208 (41 FR 24070, June 14, 1976) reflected a modification of performance requirements that reduce the number and types of tests in which the Part 572 dummy would be used in Standard No. 208 dynamic tests. Specifically, rollover and lateral testing would no longer be required if a lap belt were installed in the front seating positions. The NHTSA's July 1976 proposal noted above would conform existing tests in Standard No. 208 to the modified approach. It would also increase the permissible femur force loads that could be registered on the dummy during impact, and restrict femur force requirements to compressive forces. Interested persons should be aware of these significant potential changes in the use of the dummy in Standard No. 208.

As for the dummy objectivity treated by the proposal that underlies this notice, manufacturers' comments stressed the complexity of the test environment in which the device is used and their uncertainty as to how much the dummy characteristics contribute to the variability that is encountered. In somewhat contradictory fashion, several of the manufacturers repeated requests for a "whole systems" calibration of the dummy that would be conducted under conditions approximating the barrier crash whose complex variables had just been emphasized.

As is the case with any measuring instrument, variations in readings can result from imperfection in the instrument or variations in the phenomenon being measured (in this case, the



complex events that occur as a passenger car impacts a barrier at 30 mph, or is impacted laterally by a 4,000-pound moving barrier, or is rolled over). While the "*Chrysler*" court delayed Standard No. 208 so that variation in the dummy's behavior could be corrected, it found the standard (and the dynamic test procedures) practicable and "designed to meet the need for motor vehicle safety" (472 F2d at 674, 675). To meet the need for motor vehicle safety, the dynamic tests are realistic simulations of the actual crash environment. Variations in the precise circumstances to which the dummy is exposed from test to test are expected.

Simulation of such crashes to provide a "whole systems" calibration of the dummy would not be reasonable, however, because of the variations that are inherent in the 30-mph (and the other) impacts. Unless the inputs to the dummy during calibration are precisely controlled, as is the case with the five sub-assembly tests, the "whole systems" calibration would be meaningless. To conduct precisely controlled 30-mph barrier crash tests as part of the dummy calibration procedure would be very expensive, since dummy calibration is normally performed before and after each compliance test. The good results obtained in sub-assembly calibration, and supported by the controlled "whole dummy" test results referred to in the preamble to the proposal, make such a "whole systems" test redundant. The agency concludes that introduction into Part 572 of an extremely expensive and unfamiliar additional calibration is unjustified.

General Motors (GM), Chrysler Corporation, Ford Motor Company, and the Motor Vehicle Manufacturers Association (MVMA) stated that the dummy construction is unsuited to measurements of laterally-imposed force, thereby rendering the dummy unobjective in the "lateral impact environment." While the agency does not agree with these objections, the modified performance levels put forward by the Department of Transportation and the agency would allow manufacturers to install lap belts if they do not wish to undertake lateral or rollover testing. Any manufacturer that is concerned with the objectivity of the dummy in such impacts would provide lap belts at the front seating positions in lieu of conducting the lateral or rollover tests.

Ford and Chrysler argued that the test dummy is insufficiently specified despite the approximately 250 detailed drawings that set forth dummy construction. Their concern seems to be limited to minor contour dimensions that they consider critical to dummy objectivity. To eliminate any such concern the agency will place a specimen of the dummy in the data and drawings package and incorporate it by reference into Part 572.

The MVMA stated that its reading of the docket comments indicated that the dummy cannot be assembled as it is designed. The agency is aware that dimensional tolerances could, at their extremes, "stack up" to cause the need in rare instances for selective fitting of components. Manufacturers can avoid any such problem by reducing the dispersion of tolerances or by select fitting of components to avoid tolerance "stack-up." Of the three dummy manufacturers' comments on this proposal, only Humanoid Systems (Humanoid) listed discrepancies. The agency has reviewed the asserted discrepancies and concludes that the specifications themselves, the manufacturing practices just noted, or the calibration procedures are adequate to resolve the cited problems. To simplify the dummy, certain studs located at the side of the dummy femurs (used for mounting photographic targets and unnecessary to NHTSA test procedures) are deleted because of their potential for reducing repeatability under some circumstances. These studs are designated F/02, G/02, F/25, and G/25.

Bayerische Motorenwerke recited test experience that demonstrated different performance characteristics among the products of different dummy manufacturers, although they are all warranted to meet the specifications of the regulations. NHTSA Report DOT-HS-801-861 demonstrates that some manufacturer-warranted dummies did not meet all calibration requirements of Part 572. The agency, however, is not in a position to assume responsibility for the contractual terms established between private parties.

Humanoid noted that experience with the vinyl flesh specification of the dummy led to resolution of aging problems on which it had earlier commented. The company did recommend latitude in vinyl formulation to permit market competi-

tion. General Motors also expressed concern that specification of the Part 572 dummy not stifle innovation. Alderson Research Laboratories (ARL) once again asked that the agency specify a one-piece casting in place of the welded head presently specified. The agency sympathizes with this interest in improvement of the dummy manufacturing techniques. However, the dummy is a test instrument crucial to the validity of an important motor vehicle safety standard and as such, it cannot be loosely described for the benefit of innovation.

Volkswagen requested improvement in aging and in storage techniques for the dummy. The agency considers that it has met its responsibilities by specifying calibration tests that will signal improper storage or age-related changes. Further development in this area is within the province of the manufacturers and users. Significant improvements in aging or storage factors will, of course, not be ignored by the agency.

Although Ford and American Motors Corporation (AMC) made no comment on the specifics of the NHTSA proposal, Chrysler Corporation and several other vehicle manufacturers, as well as the dummy manufacturers, supported the proposed changes. The National Motor Vehicle Safety Advisory Council took no position on the proposal. The Vehicle Equipment Safety Commission did not comment on the proposal. Having carefully reviewed all of the comments submitted and additional data compiled by the agency, the changes are adopted, essentially as proposed. The agency proposed modification of the five calibration procedures for dummy sub-assemblies, along with minor changes in the drawings that describe all components of the dummy.

## HEAD

The head calibration involves dropping the head 10 inches so that its forehead strikes a rigid surface and registers acceleration levels that must fall within a certain range. No comments were received on the small relocation of measurement points or the specification of "instant release" of the head, and these modifications are made as proposed.

The proposal included a specification of 250 microinches (rms) for the finish of the steel plate on which the head is dropped. The agency had considered other factors (particularly friction at the skull-skin interface of the dummy forehead) that might affect the accelerometer readings. It was found that, in most instances, the dummy as received from the manufacturer conformed to the specifications. When deviations were encountered, treatment of the head in accordance with manufacturer recommendations eliminated the effect of these factors on results. Comparison of data on 100 head drop tests conducted since issuance of the proposal confirms that conclusion. Ninety-seven percent of these head drops registered readings within the specified limits, with a mean response value of 232g and a standard deviation of 14g, indicating a coefficient of variance of 6 percent. Of the three failures, the response values were 203g, 204g and 263g. All of the drop tests fell within the specified 0.9- to 1.5-ms time range at the 100g level. The surface finish of the drop plate was 63 microinches (rms). In view of this data, it does not appear necessary to adjust either the response range as advocated by Humanoid or the time range as recommended by Ford. The test results, however, support the request by a number of comments to change the proposed 250-microinch finish to a value below 100 microinches (rms). On the basis of the comments and NHTSA test data, the impact plate surface finish is specified as any value in the range from 8 to 80 microinches (rms).

General Motors asked whether coating of the steel plate is permitted. Coating is permitted so long as the 8- to 80-microinch range for the surface is maintained.

Humanoid recommended that any lubrication or surface smoothness introduced by the dummy manufacturers be made uniform in the interests of component interchange. Volkswagen also recommended a skull-to-skin interface finish specification. The NHTSA, however, does not believe that differing procedures for preparation of the skull-skin interface prevent interchange of the heads, and the requests are therefore not granted.



In view of the agency decision to incorporate by reference a specimen of the Part 572 dummy in the drawings and data package, it is also considered unnecessary to specify, as requested by Humanoid, thickness and performance specification for the headform at 45 and 90 degrees from the midsagittal plane. With regards to Humanoid's view that head drop tests are irrelevant to performance of the dummy as a measuring instrument, the agency considers them closely tied to the characteristics of the dummy that affect its repeatability as a measuring device.

Renault and Peugeot recommended consideration of a revision in the test criteria of Standard No. 208, in the case of safety belts, to replace the limitation on head acceleration with a limitation on submarining. The agency considers the present limit on head acceleration a valuable means to limit head loading and neck hyperflexion in belt systems as well as other systems. It is a requirement that is already being met on a production basis by Volkswagen.

Toyota stated that the 10g limit on lateral acceleration during the head drop would be impossible to satisfy. The NHTSA's own test experience did not exhibit any evidence of the noted problem. None of the manufacturers of dummies objected to the proposal, and Alderson Research Laboratories (ARL) supported the 10g limit. It is therefore made final as proposed.

ARL once more requested consideration of the one-piece headform in place of the welded headform presently specified. If, as ARL states, its customers accept and utilize the one-piece casting, the agency does not understand the necessity to modify the specification. ARL's request for consideration of a one-piece neck bracket is subject to the same response. As earlier noted, the justification to "freeze" the dummy specification is clear from its use as a measurement instrument that is the basis of manufacturer compliance with, and agency verification testing to, a major motor vehicle safety standard.

## NECK

Comments generally agreed with the proposed changes in the dummy neck calibration (attachment of the head form to the neck, and attachment of the neck to the end of a pendulum which

impacts an energy-absorbing element, inducing head rotation which must fall within specified limits). General Motors clarified that its engineers' reason for recommending a non-articulated neck instead of an articulated neck concerned the cost, maintenance, and complexity of the latter's construction. Volkswagen agreed with Sierra Engineering Company (Sierra) that a smaller tolerance for the pendulum's speed at impact should be considered. Humanoid agreed with the agency's view that the articulated neck does not provide the desired level of repeatability at this time. Having considered these comments the agency makes final the proposed location change for the accelerometers, deletion of § 572.7 (c) (5), and clarification of the "t4" point and the 26g level.

Manufacturers made several additional recommendations. Humanoid expressed support of AMC's view that the neck calibration should be conducted at barrier impact velocity. The agency has reviewed these comments and finds that the specified energy levels are adequate for the intended purpose of establishing dynamic response characteristics and the measurement of repeatability of dummy necks under dynamic test conditions. Testing at higher levels would bring other dummy components besides the neck into direct impact interaction, thereby obscuring or completely masking the measured phenomena.

Volkswagen cautioned against an entirely free selection of damping materials because of variation in rebound characteristics produced with different materials that can achieve conforming deceleration time histories. The agency agrees that a limit on rebound should be established to compliment the choice of damping materials and has added such a specification to the end of the text of § 572.7 (b).

Humanoid noted interference in the attachment of the neck bracket to the backplate of the sternothoracic structure, due to the presence of a welding bead. The agency has found no interference in the dummies manufactured by two companies and concludes that the interference must be associated with Humanoid's manufacturing technique.



## THORAX

The NHTSA proposed several additional specifications for test probe orientation, dummy seating, and limb positioning for the calibration test. The calibration consists of striking the torso of the seated dummy at two speeds with a specified striker to measure thorax resistance, deflection, and hysteresis characteristics. Comments did not object to the changes and they are incorporated as proposed.

The agency also proposed several changes in the drawings for the thorax sub-assembly of the dummy and, without objection, they are made final in virtually the same form. ARL indicated that four heat seals should be used on the zipper. ARL clarified that the longer socket head cap screw is intended to permit sufficient thread engagement, not more latitude in the ballast configuration as stated in the proposal. Humanoid's request to know the clavicle contours that constitute the Part 572 specification is met by placing the dummy specimen in the drawings and data package as earlier noted. Humanoid and Toyo Kogyo suggested an increase in clavicle strength. The agency's experience with the clavicle since the last consideration of this suggestion has been that all dummies are not significantly susceptible to clavicle breakage. Accordingly, the agency does not consider the modification necessary.

The major suggestion by vehicle and dummy manufacturers was a slight revision of the thorax resistance and deflection values, which must not be exceeded during impact of the chest. The present values (1400 pounds and 1.0 inch at 14 fps, 2100 pounds and 1.6 inches at 22 fps) were questioned by GM, which recommends an increase in both resistance and deflection values to better reflect accurate calibration of a correctly designed dummy. Comparable increases were recommended by Humanoid and Sierra. ARL noted that the present values are extremely stringent.

The agency's experience with calibration of the thorax since issuance of the proposal confirms that a slight increase in values is appropriate, although not the amount of increase recommended by the manufacturers. The values have accordingly been modified to 1450 pounds and 1.1 inches at 14 fps, and 2250 pounds and 1.7 inches at 22 fps. The agency does not set a

minimum limit on the value as recommended by General Motors, because the interaction of the deflection and resistance force values make lower limits unnecessary. The changes in values should ease ARL's concern about the seating surface, although the agency's own experience does not indicate that a significant problem exists with the present specifications of the surface.

In conjunction with these changes, the agency has reduced the maximum permissible hysteresis of the chest during impact to 70 percent as recommended by GM.

GM requested a clarification of the dummy limb positioning procedures for purposes of thorax impact testing, citing the possibility of limb misadjustment between steps (1) and (4) of § 572.8(d). The agency has added wording to subparagraph (4) to make clear that the limbs remain horizontally outstretched. The agency does not consider GM's suggested wording to be adequate for calibration. For example, the attitude of the test probe at impact is not specified. For this reason, the requested modification is not undertaken.

Humanoid requested clarification of paragraph (7) of § 572.8(d) that specifies measurement of horizontal deflection "in line with the longitudinal centerline of the probe." Humanoid expressed concern that, as the thorax rotated backwards, the horizontal measurement could not be made. A clarification has been added to the cited language.

Humanoid also requested a less temperature-sensitive rib damping material than is presently employed. The NHTSA concludes that its strict limitation on permissible temperature and humidity conditions for calibration testing adequately controls the effects of temperature on this damping material.

## LUMBAR SPINE, ABDOMEN

The NHTSA proposed minor modifications of the lumbar spine construction, and several changes in the procedures for lumbar spine calibration, which consists of spine flexion from the upright position, followed by release of the force which was required to attain this deflection, and measurement of the return angle. Manufacturers supported the majority of the changes, and

they are made final in this notice. The agency proposed that measurements be taken when "flexing has stopped," and Toyota, noting the difficulty of establishing this point under some circumstances, suggested that the measurement be made 3 minutes after release. This modification is reasonable and is included in the final action.

Testing at NHTSA's Safety Research Laboratory demonstrates the need to clarify proposed § 572.9(c)(3) to specify return of the lumbar spine sufficiently so that it remains in "its initial position in accordance with Figure 11" unassisted. An appropriate further specification has been made.

Humanoid requested that the four-bolt attachment of the push plate be revised to two-bolt attachment in view of Humanoid's practice of providing a two-bolt plate. The agency has undertaken its data collection using four-bolt attachment, and to preserve the uncontested validity of these data, declines to modify the proposed specification.

ARL requested reconsideration of NHTSA's decision to leave unchanged the lumbar cable ball and socket attachment design. The agency has continued to examine test results and cannot conclude that the present attachment design has caused a calibration or compliance problem. Accordingly, ARL's request is denied. An ARL request to limit the reference to the strength requirements of the military specification in the case of lumbar cable swaging is granted. If such a limitation were not specified, the other elements of the military specification might arguably be included in the NHTSA's specification.

Calibration of the abdomen of the dummy is accomplished by application of a specified force to the abdomen while the dummy torso is placed on its back, with a required "force/deflection" curve resulting. The proposal added a range of force application rates to make the procedure more uniform, as well as a 10-pound preload and further specification of the horizontal surface. Manufacturers did not oppose these changes.

Manufacturers did oppose the proposed specification changes that would require the dummy abdominal sac to be sealed. Various reasons unrelated to abdomen performance were listed (e.g., transportation of sealed sac in unpressur-

ized aircraft compartment) and available data show successful calibration in both configurations. In view of the expressed preference for the unsealed design, the leak test has been removed from the drawings, and the vent is retained.

Humanoid requested that the shape of the abdominal insert be modified to conform more closely to the dummy's abdominal cavity. The shape of the insert affects the dummy performance, however, and the agency does not consider a change with unknown consequences advisable at this time. The agency also concludes that Humanoid's request to drop all specification of wall thickness for the abdominal sac is also unadvisable for this reason.

Ford, the MVMA, and Humanoid noted an asymmetry of the dummy pelvic castings and requested a justification for it. The asymmetry is apparently an artifact of the adoption of Society of Automotive Engineers specifications, whose origin is unknown. In the agency's judgment, based on experience with numerous Part 572 dummies and evaluation of test results, no degradation in performance is attributable to the asymmetry. While the agency intends to further review the asymmetry noted, no action will be taken without evidence that the specification affects testing.

## LIMBS

Little comment was received on the changes proposed for limb calibration, which consists of impacting the knees of a seated dummy with a test probe of a specified weight at a specified speed and measuring the impact force on the dummy femurs. In response to Toyota's request for clarification, the positioning in accordance with § 572.11 is followed by the leg adjustments specified in § 572.10(c), which have the effect of changing leg position from that achieved under § 572.11.

The proposed specification of vinyl skin thickness over the knee face was supported in comments, although two manufacturers requested that the thickness tolerance be moved upward to thicken the skin somewhat. Humanoid did suggest elimination of the femur calibration as useless, but the agency considers such a control important to repeatable performance of the dummy.



Ford interpreted information contained in contract work undertaken for the NHTSA (DOT-HS-4-00873) to show that femur force loads registered too high in 50 percent of cases conducted under the calibration conditions of the standard. In NHTSA tests of 100 dummy knees on Part 572 dummies (DOT-HS-801 861), the 2,500-pound limit was exceeded only twice. The same data indicated a tendency for the femur to register lower than previously estimated, and a minor reduction of the lower limit is established in this action. The agency considers the small reduction to fall within the ambit of the proposal to improve conditions for calibration.

Ford's and Humanoid's observations with regard to off-center impacts that result in bending or torque have been dealt with in the recent agency proposal to limit femur force requirements of Standard No. 208 to compressive force. As for Humanoid's concern that unacceptable variation is possible in the femur load cell, it is noted that General Motors and Volkswagen have both certified thousands of vehicles based on impact readings taken from this dummy with these femur cells installed.

#### GENERAL TEST CONDITIONS

The agency proposed minor changes in the general test conditions of § 572.11 that apply to dummy test, such as a minimum period of dummy exposure to the temperature and humidity at which calibration tests are conducted. With correction of accelerometer locations, a clarification of dummy positioning, and an increase of zipper heat seals from three to four, the contemplated changes are made as proposed.

Sierra requested a broader range of humidity conditions for the calibration tests, stating that a range of 10- to 90-percent humidity would not affect results of "performance tests." The company cited freezing and desert heat conditions as reasons for a 6-hour conditioning rather than the 4-hour conditioning proposed by the agency. Humanoid and Toyota also addressed this aspect of the general test conditions. It appears that Sierra misunderstood the temperature and humidity specifications as applicable to vehicle performance tests. This rulemaking action addresses only calibration tests which presumably would be conducted indoors in a temperature-

controlled setting. Because the dummies are not expected to be stored in areas of great temperature extremes prior to calibration testing, the proposed ranges of humidity and temperature conditions are considered to be effective to stabilize the affected dummy properties. While instrumentation would be affected by the 90-percent humidity condition suggested by Sierra, the agency has reduced the lower humidity condition to a 10-percent level in agreement that the change does not affect the ability to calibrate the dummy.

Sierra objected that a dummy manufacturer's warranty of conformity of its products to Part 572 would be complicated by a time specification for temperature and humidity conditioning. The company believed that its customers would require that 4 hours of conditioning occur whether or not the dummy had already stabilized at the correct temperature. The agency sees no reason why a purchaser would insist on a senseless condition but, in any case, has no control over the contractual dealings between the dummy manufacturer and the purchaser. The NHTSA cannot delete necessary stabilizing conditions from its regulations simply because a purchaser wishes to make an unreasonable contractual specification based on it. The same rationale is responsive to Sierra's request for shorter recovery intervals between repeated tests.

Toyota supplied data to demonstrate that more consistent thorax and knee impact tests could be achieved by using cotton pants on the dummy. The agency's data do not agree with Toyota's and no other manufacturer took issue with the agency's proposal to delete all clothing requirements. This deletion is made final as proposed.

ARL asked why the agency's proposed prohibition against painting dummy components is qualified to state "except as specified in this part or in drawings subtended by this part." This qualification simply preserves the agency's opportunity to specify painted components in the future.

No conclusive evidence of preferable storage methods was submitted by commenters. The agency therefore does not specify that the dummy calibrations be preceded by positioning in a specific posture. To avoid the possibility of introducing a variable, however, the eye bolt in the



dummy head has been relabeled on the drawings as "not for use in suspending dummy in storage."

Interested persons are advised that the first stage of choosing a replacement foaming agent for the specified Nitrosan are complete. Details are available in document HS-802-030 in the public docket.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The changes made are all to existing specifications and calibration procedures and are intended as clarifications of specifications already established. Therefore, the cost of the changes are calculated as minimal, consisting at most of relatively small modifications of test equipment and minor dummy components. The number and complexity of calibration tests are not affected by the changes. At the same time, the clarification will improve a manufacturer's ability to conduct compliance tests of safety systems and will thereby contribute to an increase in motor vehicle safety.

**Note—**

The economic and inflationary impacts of this rulemaking have been carefully evaluated in accordance with Office of Management and Budget Circular A-107, and an Inflation Impact Statement is not required.

In anticipation of the use of dummies other than the 50th-percentile male dummy in compliance testing, the agency takes this opportunity to reorganize Part 572 so that the 50th-percentile dummy occupies only one Subpart.

In consideration of the foregoing, 49 CFR Part 572, *Anthropomorphic Test Dummy*, and the dummy design drawings incorporated by reference in Part 572, are amended . . . .

*Effective date:* August 8, 1977.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 31, 1977.

John W. Snow  
Administrator

**42 F.R. 7148**  
**February 7, 1977**

## PREAMBLE TO AMENDMENT TO PART 572—ANTHROPOMORPHIC TEST DUMMIES

(Docket No. 74-14; Notice 11; Docket No. 73-8; Notice 07)

This notice amends occupant crash protection Standard No. 208 and its accompanying test dummy specification to further specify test procedures and injury criteria. The changes are minor in most respects and reflect comments by manufacturers of test dummies and vehicles and the NHTSA's own test experience with the standard and the test dummy.

Date: Effective date—July 5, 1978.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Mr. Guy Hunter,  
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Supplementary information: Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), is a Department of Transportation safety standard that requires manufacturers to provide a means of restraint in new motor vehicles to keep occupants from impacting the vehicle interior in the event a crash occurs. The standard has, since January 1968, required the provision of seat belt assemblies at each seating position in passenger cars. In January 1972 the requirements for seat belts were upgraded and options were added to permit the provision of restraint that is "active" (requiring some action be taken by the vehicle occupant, as in the case of seat belts) or "passive" (providing protection without action being taken by the occupant).

In a separate notice issued today (42 FR 34289; FR Reg. 77-19137), the Secretary of

Transportation has reached a decision regarding the future occupant crash protection that must be installed in passenger cars. The implementation of that decision will involve the testing of passive restraint systems in accordance with the test procedures of Standard No. 208, and this notice is intended to make final several modifications of that procedure which have been proposed for change by the NHTSA. This notice also responds to two petitions for reconsideration of rulemaking involving the test dummy that is used to evaluate the compliance of passive restraints systems.

### DOCKET 74-14; NOTICE 05

Notice 5 was issued July 15, 1976 (41 FR 29715; July 19, 1976) and proposed that Standard No. 208's existing specification for passive protection in frontal, lateral, and rollover modes (S4.1.2.1) be modified to specify passive protection in the frontal mode only, with an option to provide passive protection or belt protection in the lateral and rollover crash modes. Volkswagen had raised the question of the feasibility of small cars meeting the standard's lateral impact requirements: A 20-mph impact by a 4,000-pound, 60-inch-high flat surface. The agency noted the particular vulnerability of small cars to side impact and the need to provide protection for them based on the weight of other vehicles on the highway, but agreed that it would be difficult to provide passive lateral protection in the near future. Design problems also underlay the proposal to provide a belt option in place of the existing passive rollover requirement.

Ford Motor Company argued that a lateral option would be inappropriate in Standard No. 208 as long as the present dummy is used for

measurement of passive system performance. This question of dummy use as a measuring device is treated later in this notice. General Motors Corporation (GM) supported the option without qualification, noting that the installation of a lap belt with a passive system "would provide comparable protection to lap-shoulder belts in side and rollover impacts." Chrysler did not object to the option, but noted that the lap belt option made the title of S4.1.2.1 ("complete passive protection") misleading. Volkswagen noted that its testing of belt systems without the lap belt portion showed little loss in efficacy in rollover crashes. No other comments on this proposal were received. The existing option S4.1.2.1 is therefore adopted as proposed so that manufacturers will be able to immediately undertake experimental work on passive restraints on an optional basis in conformity with the Secretary's decision.

There were no objections to the agency's proposal to permit either a Type 1 or Type 2 seat belt assembly to meet the requirements, and thus it is made final as proposed.

The NHTSA proposed two changes in the injury criteria of S6 that are used as measures of a restraint system's qualification to Standard No. 208. One change proposed an increase in permissible femur force limits from 1,700 pounds to 2,250 pounds. As clarification that tension loads are not included in measurement of these forces, the agency also proposed that the word "compressive" be added to the text of S6.4. Most commenters were cautionary about the changes, pointing out that susceptibility to fracture is time dependent, that acetabular injury could be exacerbated by increased forces, and that angular applications of force were as likely in the real world as axial forces and would more likely fracture the femur.

The agency is aware of and took into account these considerations in proposing the somewhat higher femur force limit. The agency started with the actual field experience of occupants of GM and Volkswagen vehicles that have been shown to produce femur force readings of about 1,700 pounds. Occupants of these vehicles involved in crashes have not shown a significant

incidence of femur fracture. The implication from this experience that the 1,700-pound figure can safely be raised somewhat is supported in work by Patrick on compressive femur forces of relatively long duration. The Patrick data (taken with aged embalmed cadavers) indicate that the average fracture load of the patella-femur-pelvis complex is 1,910 pounds. This average is considered conservative, in that cadaver bone structure is generally weaker than living human tissues. While these data did not address angular force applications, the experience of the GM and Volkswagen vehicle occupants does suggest that angular force application can go higher than 1,700 pounds.

The agency does not agree that the establishment of the somewhat higher outer limit for permissible femur force loads of 2,250 pounds is arbitrary. What is often ignored by the medical community and others in commenting on the injury criteria found in motor vehicle safety standards is that manufacturers must design their restraint systems to provide greater protection than the criteria specified, to be certain that each of their products will pass compliance tests conducted by the NHTSA. It is a fact of industrial production that the actual performance of some units will fall below nominal design standards (for quality control and other reasons). Volkswagen made precisely this point in its comments. Because the National Traffic and Motor Vehicle Safety Act states that each vehicle must comply (15 U.S.C. § 1392(a)(1)(a)), manufacturers routinely design in a "compliance margin" of superior performance. Thus, it is extremely unlikely that a restraint system designed to meet the femur force load criterion of 2,250 pounds will in fact be designed to provide only that level of performance. With these considerations in mind, the agency makes final the changes as proposed.

While not proposed for change, vehicle manufacturers commented on a second injury criterion of the standard: A limitation of the acceleration experienced by the dummy thorax during the barrier crash to 60g, except for intervals whose cumulative duration is not more than 3 milliseconds (ms). Until August 31, 1977, the agency has specified the Society of Automotive Engi-



neers' (SAE) "severity index" as a substitute for the 60g-3ms limit, because of greater familiarity of the industry with that criterion.

General Motors recommended that the severity index be continued as the chest injury criterion until a basis for using chest deflection is developed in place of chest acceleration. GM cited data which indicate that chest injury from certain types of blunt frontal impact is a statistically significant function of chest deflection in humans, while not a function of impact force or spinal acceleration. GM suggested that a shift from the temporary severity index measure to the 60g-3ms measurement would be wasteful, because there is no "strong indication" that the 60g-3ms measurement is more meaningful than the severity index, and some restraint systems have to be redesigned to comply with the new requirement.

Unlike GM, Chrysler argued against the use of acceleration criteria of either type for the chest, and rather advocated that the standard be delayed until a dummy chest with better deflection characteristics is developed.

The Severity Index Criterion allows higher loadings and therefore increases the possibility of adverse effects on the chest. It only indirectly limits the accelerations and hence the forces which can be applied to the thorax. Acceleration in a specific impact environment is considered to be a better predictor of injury than the Severity Index.

NHTSA only allowed belt systems to meet the Severity Index Criterion of 1,000 instead of the 60g-3ms criterion out of consideration for lead-time problems, not because the Severity Index Criterion was considered superior. It is recognized that restraint systems such as lap-shoulder belts apply more concentrated forces to the thorax than air cushion restraint, and that injury can result at lower forces and acceleration levels. It is noted that the Agency is considering rulemaking to restrict forces that may be applied to the thorax by the shoulder belt of any seat belt assembly (41 FR 54961; December 16, 1976).

With regard to the test procedures and conditions that underlie the requirements of the standard, the agency proposed a temperature range for testing that would be compatible with the

temperature sensitivity of the test dummy. The test dummy specification (Part 572, "*Anthropomorphic Test Dummy*," 49 CFR Part 572) contains calibration tests that are conducted at any temperature between 66° and 78° F. This is because properties of lubricants and nonmetallic parts used in the dummy will change with large temperature changes and will affect the dummy's objectivity as a test instrument. It was proposed that the Standard No. 208 crash tests be conducted within this temperature range to eliminate the potential for variability.

The only manufacturers that objected to the temperature specification were Porsche, Bayerische Motoren Werke (BMW), and American Motors Corporation (AMC). In each case, the manufacturers noted that dynamic testing is conducted outside and that it is unreasonable to limit testing to the few days in the year when the ambient temperature would fall within the specified 12-degree range.

The commenters may misunderstand their certification responsibilities under the National Traffic and Motor Vehicle Safety Act. Section 108(b)(2) limits a manufacturer's responsibility to the exercise of "due care" to assure compliance. The NHTSA has long interpreted this statutory "due care" to mean that the manufacturer is free to test its products in any fashion it chooses, as long as the testing demonstrates that due care was taken to assure that, if tested by NHTSA as set forth in the standard, the product would comply with the standard's requirements. Thus, a manufacturer could conduct testing on a day with temperatures other than those specified, as long as it could demonstrate through engineering calculations or otherwise, that the difference in test temperatures did not invalidate the test results. Alternatively, a manufacturer might choose to perform its preparation of the vehicle in a temporarily erected structure (such as a tent) that maintains a temperature within the specified range, so that only a short exposure during acceleration to the barrier would occur in a higher or lower temperature. To assist any such arrangements, the test temperature condition has been limited to require a stabilized temperature of the test dummy only, just prior to the vehicle's travel toward the barrier.

In response to an earlier suggestion from GM, the agency proposed further specificity in the clothing worn by the dummy during the crash test. The only comment was filed by GM, which argued that any shoe specification other than weight would be unrelated to dummy performance and therefore should not be included in the specification. The agency disagrees, and notes that the size and shape of the heel on the shoe can affect the placement of the dummy limb within the vehicle. For this reason, the clothing specifications are made final as proposed, except that the requirement for a conforming "configuration" has been deleted.

Renault and Peugeot asked for confirmation that pyrotechnic pretensioners for belt retractors are not prohibited by the standard. The standard's requirements do not specify the design by which to provide the specified protection, and the agency is not aware of any aspect of the standard that would prohibit the use of pretensioning devices, as long as the three performance elements are met.

With regard to the test dummy used in the standard, the agency proposed two modifications of Standard No. 208: a more detailed positioning procedure for placement of the dummy in the vehicle prior to the test, and a new requirement that the dummy remain in calibration without adjustment following the barrier crash. Comments were received on both aspects of the proposal.

The dummy positioning was proposed to eliminate variation in the conduct of repeatable tests, particularly among vehicles of different sizes. The most important proposed modification was the use of only two dummies in any test of front seat restraints, whether or not the system is designed for three designated seating positions. The proposal was intended to eliminate the problem associated with placement of three 50th-percentile male dummies side-by-side in a smaller vehicle. In bench seating with three positions, the system would have to comply with a dummy at the driver's position and at either of the other two designated seating positions.

GM supported this change, but noted that twice as many tests of 3-position bench-seat vehicles would be required as before. The company suggested using a simulated vehicle crash as a

means to test the passive restraint at the center seat position. The agency considers this approach unrepresentative of the actual crash pulse and vehicle kinematic response (e.g., pitching, yawing) that occur during an impact. To the degree that GM can adopt such an approach in the exercise of "due care" to demonstrate that the center seating position actually complies, the statute does not prohibit such a certification approach.

Ford objected that the dummy at the center seat position would be placed about 4 inches to the right of the center of the designated seating position in order to avoid interference with the dummy at the driver's position. While the NHTSA agrees that a small amount of displacement is inevitable in smaller vehicles, it may well occur in the real world also. Further, the physical dimensions of the dummy preclude any other positioning. With a dummy at the driver's position, a dummy at the center position cannot physically be placed in the middle of the seat in all cases. In view of these realities, the agency makes final this aspect of the dummy positioning as proposed.

GM suggested the modification of other standards to adopt "2-dummy" positioning. The compatibility among dynamic tests is regularly reviewed by the NHTSA and will be again following this rulemaking action. For the moment, however, only those actions which were proposed will be acted on.

As a general matter with regard to dummy positioning, General Motors found the new specifications acceptable with a few changes. GM cautioned that the procedure might not be sufficiently reproducible between laboratories, and Chrysler found greater variation in positioning with the new procedures than with Chrysler's own procedures. The agency's use of the procedure in 15 different vehicle models has shown consistently repeatable results, as long as a reasonable amount of care is taken to avoid the effect of random inputs (see "Repeatability of Set Up and Stability of Anthropometric Landmarks and Their Influence on Impact Response of Automotive Crash Test Dummies." Society of Automotive Engineers, Technical Paper No. 770260, 1977). The agency concludes that, with the



minor improvements cited below, the positioning procedure should be made final as proposed.

The dummy is placed at a seating position so that its midsagittal plane is vertical and longitudinal. Volkswagen argued against use of the midsagittal plane as a reference for dummy placement, considering it difficult to define as a practical matter during placement. The agency has used plane markers and plane lines to define the midsagittal plane and has experienced no significant difficulty in placement of the dummy with these techniques. For this reason, and because Volkswagen suggested no simpler orientation technique, the agency adopts use of the midsagittal plane as proposed.

Correct spacing of the dummy's legs at the driver position created the largest source of objections by commenters. Ford expressed concern that an inward-pointing left knee could result in unrealistically high femur loads because of femur-to-steering column impacts. GM asked that an additional 0.6 inch of space be specified between the dummy legs to allow for installation of a device to measure steering column displacement. Volkswagen considered specification of the left knee bolt location to be redundant in light of the positioning specification for the right knee and the overall distance specification between the knees of 14.5 inches.

The commenters may not have understood that the 14.5- and 5.9-inch dimensions are only initial positions, as specified in S8.1.11.1.1. The later specification to raise the femur and tibia centerlines "as close as possible to vertical" without contacting the vehicle shifts the knees from their initial spacing to a point just to the left and right of the steering column.

As for GM's concern about instrumentation, the agency does not intend to modify this positioning procedure to accommodate instrumentation preferences not required for the standard's purposes. GM may, of course, make test modifications so long as it assures, in the exercise of due care, that its vehicles will comply when tested in accordance with the specification by the agency.

In the case of a vehicle which is equipped with a front bench seat, the driver dummy is placed on the bench so that its midsagittal plane inter-

sects the center point of the plane described by the steering wheel rim. BMW pointed out that the center plane of the driver's seating position may not coincide with the steering wheel center and that dummy placement would therefore be unrealistic. Ford believed that the specification of the steering wheel reference point could be more precisely specified.

The agency believes that BMW may be describing offset of the driver's seat from the steering wheel in bucket-seat vehicles. In the case of bench-seat vehicles, there appears to be no reason not to place the dummy directly behind the steering wheel. As for the Ford suggestion, the agency concludes that Ford is describing the same point as the proposal did, assuming, as the agency does, that the axis of the steering column passes through the center point described. The Ford description does have the effect of moving the point a slight distance laterally, because the steering wheel rim upper surface is somewhat higher than the plane of the rim itself. This small distance is not relevant to the positioning being specified and therefore is not adopted.

In the case of center-position dummy placement in a vehicle with a drive line tunnel, Ford requested further specification of left and right foot placement. The agency has added further specification to make explicit what was implicit in the specifications proposed.

Volkswagen suggested that the NHTSA had failed to specify knee spacing for the passenger side dummy placement. In actuality, the specification in S8.1.11.1.2 that the femur and tibia centerlines fall in a vertical longitudinal plane has the effect of dictating the distance between the passenger dummy knees.

The second major source of comments concerned the dummy settling procedure that assures uniformity of placement on the seat cushion and against the seat back. Manufacturers pointed out that lifting the dummy within the vehicle, particularly in small vehicles and those with no rear seat space, cannot be accomplished easily. While the NHTSA recognizes that the procedure is not simple, it is desirable to improve the uniformity of dummy response and it has been accomplished by the NHTSA in several small cars (e.g., Volkswagen Rabbit, Honda Civic, Fiat



Spider, DOT HS-801-754). Therefore, the requests of GM and Volkswagen to retain the method that does not involve lifting has been denied. In response to Renault's question, the dummy can be lifted manually by a strap routed beneath the buttocks. Also, Volkswagen's request for more variability in the application of rearward force is denied because, while difficult to achieve, it is desirable to maintain uniformity in dummy placement. In response to the requests of several manufacturers, the location of the 9-square-inch push plate has been raised 1.5 inches, to facilitate its application to all vehicles.

Volkswagen asked with regard to S10.2.2 for a clarification of what constitutes the "lumbar spine" for purposes of dummy flexing. This refers to the point on the dummy rear surface at the level of the top of the dummy's rubber spine element.

BMW asked the agency to reconsider the placement of the driver dummy's thumbs over the steering wheel rim because of the possibility of damage to them. The company asked for an option in placing the hands. The purpose of the specification in dummy positioning, however, is to remove discretion from the test personnel, so that all tests are run in the same fashion. An option under these circumstances is therefore not appropriate.

Ultrasystems, Inc., pointed out two minor errors in S10.3 that are hereby corrected. The upper arm and lower arm centerlines are oriented as nearly as possible in a vertical plane (rather than straight up in the vertical), and the little finger of the passenger is placed "barely in contact" with the seat rather than "tangent" to it.

Two corrections are made to the dummy positioning procedure to correct obvious and unintended conflicts between placement of the dummy thighs on the seat cushion and placement of the right leg and foot on the acceleration pedal.

In addition to the positioning proposed, General Motors suggested that positioning of the dummy's head in the fore-and-aft axis would be beneficial. The agency agrees and has added such a specification at the end of the dummy settling procedure.

In a matter separate from the positioning procedure, General Motors, Ford, and Renault requested deletion of the proposed requirement that the dummy maintain proper calibration following a crash test without adjustment. Such a procedure is routine in test protocols and the agency considered it to be a beneficial addition to the standard to further demonstrate the credibility of the dummy test results. GM, however, has pointed out that the limb joint adjustments for the crash test and for the calibration of the lumber bending test are different, and that it would be unfair to expect continued calibration without adjustment of these joints. The NHTSA accepts this objection and, until a means for surmounting this difficulty is perfected, the proposed change to S8.1.8 is withdrawn.

In another matter unrelated to dummy positioning, Volkswagen argued that active belt systems should be subject to the same requirements as passive belt systems, to reduce the cost differential between the compliance tests of the two systems. As earlier noted the NHTSA has issued an advance Notice of Proposed Rulemaking (41 FR 54961, December 16, 1976) on this subject and will consider Volkswagen's suggestion in the context of that rulemaking.

Finally, the agency proposed the same belt warning requirements for belts provided with passive restraints as are presently required for active belts. No objections to the requirement were received and the requirement is made final as proposed. The agency also takes the opportunity to delete from the standard the out-of-date belt warning requirements contained in S7.3 of the standard.

#### RECONSIDERATION OF DOCKET 73-8; NOTICE 04

The NHTSA has received two petitions for reconsideration of recent amendments in its test dummy calibration test procedures and design specifications (Part 572, "*Anthropomorphic Test Dummy*," 49 CFR Part 572). Part 572 establishes, by means of approximately 250 drawings and five calibration tests, the exact specifications of the test device referred to earlier in this notice that simulates the occupant of a motor vehicle for crash testing purposes.

Apart from requests for a technical change of the lumbar flexion force specifications, the petitions from General Motors and Ford contained a repetition of objections made earlier in the rule-making about the adequacy of the dummy as an objective measuring device. Three issues were raised: lateral response characteristics of the dummy, failure of the dummy to meet the five subassembly calibration limits, and the need for a "whole systems" calibration of the assembled dummy. Following receipt of these comments, the agency published notification in the *Federal Register* that it would entertain any other comments on the issue of objectivity (42 FR 28200; June 2, 1977). General comments were received from Chrysler Corporation and American Motors, repeating their positions from earlier comments that the dummy does not qualify as objective.

The objectivity of the dummy is at issue because it is the measuring device that registers the acceleration and force readings specified by Standard No. 208 during a 30-mph impact of the tested vehicle into a fixed barrier. The resulting readings for each vehicle tested must remain below a certain level to constitute compliance. Certification of compliance by the vehicle manufacturer is accomplished by crash testing representative vehicles with the dummy installed. Verification of compliance by the NHTSA is accomplished by crash testing one or more of the same model vehicle, also with a test dummy installed. It is important that readings taken by different dummies, or by the same dummy repeatedly, accurately reflect the forces and accelerations that are being experienced by the vehicle during the barrier crash. This does not imply that the readings produced in tests of two vehicles of the same design must be identical. In the real world, in fact, literally identical vehicles, crash circumstances, and test dummies are not physically attainable.

It is apparent from this discussion that an accurate reflection of the forces and accelerations experienced in nominally identical vehicles does not depend on the specification of the test dummy alone. For example, identically specified and responsive dummies would not provide identical readings unless reasonable care is exercised in the preparation and placement of the dummy. Such

care is analogous to that exercised in positioning a ruler to assure that it is at the exact point where a measurement is to commence. No one would blame a ruler for a bad measurement if it were carelessly placed in the wrong position.

It is equally apparent that the forces and accelerations experienced in nominally identical vehicles will only be identical by the greatest of coincidence. The small differences in body structure, even of mass-produced vehicles, will affect the crash pulse. The particular deployment speed and shape of the cushion portion of an inflatable restraint system will also affect results.

All of these factors would affect the accelerations and forces experienced by a human occupant of a vehicle certified to comply with the occupant restraint standard. Thus, achievement of identical conditions is not only impossible (due to the inherent differences between tested vehicles and underlying conditions) but would be unwise. Literally identical tests would encourage the design of safety devices that would not adequately serve the variety of circumstances encountered in actual crash exposure.

At the same time, the safety standards must be "stated in objective terms" so that the manufacturer knows how its product will be tested and under what circumstances it will have to comply. A complete lack of dummy positioning procedures would allow placement of the dummy in any posture and would make certification of compliance virtually impossible. A balancing is provided in the test procedures between the need for realism and the need for objectivity.

The test dummy also represents a balancing between realism (biofidelity) and objectivity (repeatability). One-piece cast metal dummies could be placed in the seating positions and instrumented to register crash forces. One could argue that these dummies did not act at all like a human and did not measure what would happen to a human, but a lack of repeatability could not be ascribed to them. At the other end of the spectrum, an extremely complex and realistic surrogate could be substituted for the existing Part 572 dummy, which would act realistically but differently each time, as one might expect different humans to do.



The existing Part 572 dummy represents 5 years of effort to provide a measuring instrument that is sufficiently realistic and repeatable to serve the purposes of the crash standard. Like any measuring instrument, it has to be used with care. As in the case of any complex instrumentation, particular care must be exercised in its proper use, and there is little expectation of literally identical readings.

The dummy is articulated, and built of materials that permit it to react dynamically, similarly to a human. It is the dynamic reactions of the dummy that introduce the complexity that makes a check on repeatability desirable and necessary. The agency therefore devised five calibration procedures as standards for the evaluation of the important dynamic dummy response characteristics.

Since the specifications and calibration procedures were established in August 1973, a substantial amount of manufacturing and test experience has been gained in the Part 572 dummy. The quality of the dummy as manufactured by the three available domestic commercial sources has improved to the point where it is the agency's judgment that the device is as repeatable and reproducible as instrumentation of such complexity can be. As noted, GM and Ford disagree and raised three issues with regard to dummy objectivity in their petitions for reconsideration.

*Lateral response characteristics.* Recent sled tests of the Part 572 dummy in lateral impacts show a high level of repeatability from test to test and reproducibility from one dummy to another ("Evaluation of Part 572 Dummies in Side Impacts"—DOT HS 020 858). Further modification of the lateral and rollover passive restraint requirements into an option that can be met by installation of a lap belt makes the lateral response characteristics of the dummy largely academic. As noted in Notice 4 of Docket 73-8 (42 FR 7148; February 7, 1977), "Any manufacturer that is concerned with the objectivity of the dummy in such [lateral] impacts would provide lap belts at the front seating positions in lieu of conducting the lateral or rollover tests."

While the frontal crash test can be conducted at any angle up to 30 degrees from perpendicular to the barrier face, it is the agency's finding that

the lateral forces acting on the test instrument are secondary to forces in the midsagittal plane and do not operate as a constraint on vehicle and restraint design. Compliance tests conducted by NHTSA to date in the 30-degree oblique impact condition have consistently generated similar dummy readings. In addition, they are considerably lower than in perpendicular barrier impact tests, which renders them less critical for compliance certification purposes.

*Repeatability of dummy calibration.* Ford questioned the dummy's repeatability, based on its analysis of "round-robin" testing conducted in 1973 for Ford at three different test laboratories (Ford Report No. ESRO S-76-3 (1976)) and on analysis of NHTSA calibration testing of seven test dummies in 1974 (DOT-HS-801-861).

In its petition for reconsideration, Ford equated dummy objectivity with repeatability of the calibration test results and concluded "it is impracticable to attempt to meet the Part 572 component calibration requirements with test dummies constructed according to the Part 572 drawing specifications."

The Ford analysis of NHTSA's seven dummies showed only 56 of 100 instances in which all of the dummy calibrations satisfied the criteria. The NHTSA's attempts to reproduce the Ford calculations to reach this conclusion were unsuccessful, even after including the HO3 dummy with its obviously defective neck. This neck failed badly 11 times in a row, and yet Ford apparently used these tests in its estimate of 56 percent compliance. This is the equivalent of concluding that the specification for a stop watch is inadequate because of repeated failure in a stop watch with an obviously defective part. In this case, the calibration procedure was doing precisely its job in identifying the defective part by demonstrating that it did not in fact meet the specification.

The significance of the "learning curve" for quality control in dummy manufacture is best understood by comparison of three sets of dummy calibration results in chronological order. Ford in earlier comments relied on its own "round-robin" crash testing, involving nine test dummies. Ford stated that none of the nine dummies could pass all of the component calibration require-



ments. What the NHTSA learned through follow-up questions to Ford was that three of the nine dummies were not built originally as Part 572 dummies, and that the other six were not fully certified by their manufacturers as qualifying as Part 572 dummies. In addition, Ford instructed its contractors to use the dummies as provided whether or not they met the Part 572 specifications.

In contrast, recent NHTSA testing conducted by Calspan (DOT-HS-6-01514, May and June 1977 progress reports) and the results of tests conducted by GM (USG 1502, Docket 73 S, GR 64) demonstrate good repeatability and reproducibility of dummies. In the Calspan testing a total of 152 calibration tests were completed on four dummies from two manufacturers. The results for all five calibration tests were observed to be within the specified performance criteria of Part 572. The agency concludes that the learning curve in the manufacturing process has reached the point where repeatability and reproducibility of the dummy has been fully demonstrated.

Interestingly, Ford's own analysis of its round-robin testing concludes that variations among the nine dummies were not significant to the test results. At the same time, the overall acceleration and force readings did vary substantially. Ford argued that this showed unacceptable variability of the test as a whole, because they had used "identical" vehicles for crash testing. Ford attributed the variations in results to "chance factors," listing as factors placement of the dummy, postural changes during the ride to the barrier, speed variations, uncertainty as to just what part of the instrument panel or other structure would be impact loaded, instrumentation, and any variations in the dynamics of air bag deployment from one vehicle to another.

The agency does not consider these to be uncontrolled factors since they can be greatly reduced by carefully controlling test procedures. In addition, they are not considered to be unacceptable "chance factors" that should be eliminated from the test. The most important advantage of the barrier impact test is that it simulates with some realism what can be experienced by a human occupant, while at the same time limiting variation to achieve repeatability.

As discussed, nominally identical vehicles are not in fact identical, the dynamics of deployment will vary from vehicle to vehicle, and humans will adopt a large number of different seated positions in the real world. The 30-mph barrier impact requires the manufacturer to take these variables into account by providing adequate protection for more than an overly structured test situation. At the same time, dummy positioning is specified in adequate detail so that the manufacturer knows how the NHTSA will set up a vehicle prior to conducting compliance test checks.

*"Whole systems" calibration.* Ford and GM both suggested a "whole systems" calibration of the dummy as a necessary additional check on dummy repeatability. The agency has denied these requests previously, because the demonstrated repeatability and reproducibility of Part 572 dummies based on current specification is adequate. The use of whole systems calibration tests as suggested would be extremely expensive and would unnecessarily complicate compliance testing.

It is instructive that neither General Motors nor Ford has been specific about the calibration tests they have in mind. Because of the variables inherent in a high energy barrier crash test at 30 mph, the agency judges that any calibration readings taken on the dummy would be overwhelmed by the other inputs acting on the dummy in this test environment. The Ford conclusion from its round-robin testing agrees that dummy variability is a relatively insignificant factor in the total variability experienced in this type of test.

GM was most specific about its concern for repeatability testing of the whole dummy in its comments in response to Docket 74-14; Notice 01:

Dummy whole body response requirements are considered necessary to assure that a dummy, assembled from certified components, has acceptable response as a completed structure. Interactions between coupled components and subsystems must not be assumed acceptable simply because the components themselves have been certified. Variations in coupling may lead to significant variation in dummy response.

There is a far simpler, more controlled means to assure oneself of correct coupling of components than by means of a "whole systems" calibration. If, for example, a laboratory wishes to assure itself that the coupling of the dummy neck structure is properly accomplished, a simple statically applied input may be made to the neck prior to coupling to obtain a sample reading, and then the same simple statically applied input may be repeated after the coupling has been completed. This is a commonly accepted means to assure that "bolting together" the pieces is properly accomplished.

*Lumbar spine flexion.* The flexibility of the dummy spine is specified by means of a calibration procedure that involves bending the spine through a forward arc, with specified resistance to the bending being registered at specified angles of the bending arc. The dummy's ability to flex is partially controlled by the characteristics of the abdominal insert. In Notice 04, the agency increased the level of resistance that must be registered, in conjunction with a decision not to specify a sealed abdominal sac as had been proposed. Either of these dummy characteristics could affect the lumbar spine flexion performance.

Because of the agency's incomplete explanation for its actions, Ford and General Motors petitioned for reconsideration of the decision to take one action without the other. Both companies suggested that the specification of resistance levels be returned to that which had existed previously. The agency was not clear that it intended to go forward with the stiffer spine flexion performance, quite apart from the decision to not specify an abdomen sealing specification. The purpose for the "stiffer" spine is to attain more consistent torso return angle and to assure better dummy stability during vehicle acceleration to impact speed.

To assure itself of the wisdom of this course of action, the agency has performed dummy calibration tests demonstrating that the amended spine flexion and abdominal force deflection characteristics can be consistently achieved with both vented and unvented abdominal inserts (DOT HS 020875 (1977)).

Based on the considered analysis and review set forth above, the NHTSA denies the petitions

of General Motors and Ford Motor Company for further modification of the test dummy specification and calibration procedures for reasons of test dummy objectivity.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended as proposed with changes set forth below, and Part 572 (49 CFR Part 572) is amended by the addition of a new sentence at the end of § 572.5, *General Description*, that states: "A specimen of the dummy is available for surface measurements, and access can be arranged through: Office of Crashworthiness, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590."

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200; April 16, 1976), the Department has evaluated the economic and other consequences of this amendment on the public and private sectors. The modifications of an existing option, the simplification and clarification of test procedures, and the increase in femur force loads are all judged to be actions that simplify testing and make it less expensive. It is anticipated that the "two dummy" positioning procedure may occasion additional testing expense in some larger vehicles, but not the level of expense that would have general economic effects.

The effective date for the changes has been established as one year from the date of publication to permit Volkswagen, the only manufacturer presently certifying compliance of vehicles using these test procedures, sufficient time to evaluate the effect of the changes on the compliance of its products.

The program official and lawyer principally responsible for the development of this amendment are Guy Hunter and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 30, 1977.

Joan Claybrook  
Administrator

**42 F.R. 34299**  
**July 5, 1977**



# PREAMBLE TO AMENDMENT TO PART 572—ANTHROPOMORPHIC TEST DUMMIES REPRESENTING SIX-MONTH-OLD AND THREE-YEAR-OLD CHILDREN

(Docket No. 78-09; Notice 4)

**ACTION:** Final rule.

**SUMMARY:** This notice is issued in conjunction with new Standard No. 213, *Child Restraint Systems*, which requires child restraint systems to be dynamically tested using anthropomorphic test dummies representing 6-month-old and 3-year-old children. This notice establishes the specifications for the dummies to be used in the child restraint testing. In addition, it sets performance criteria as calibration checks to assure the repeatability of the dummy's performance.

**DATES:** The amendment is effective upon publication in the Federal Register. December 27, 1979.

**ADDRESSES:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

**FOR FURTHER INFORMATION CONTACT:**

Mr. Vladislav Radovich, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590  
(202-426-2264)

**SUPPLEMENTARY INFORMATION:**

This notice amends Part 572, *Anthropomorphic Test Dummies*, to establish specifications and performance requirements for two test dummies, one representing a 6-month-old child and the other representing a 3-year-old child. This final rule is issued to supplement new Standard No. 213, *Child Restraint Systems*, published in the *Federal Register* for December 13, 1979 (44 FR 72131). Standard No. 213 evaluates the performance of child restraints in dynamic sled tests using the anthropomorphic test dummies whose specifica-

tions are established in this final rule. Restraints recommended for children weighing 20 pounds or less will be tested with an anthropomorphic dummy representing a 6-month-old child and restraints recommended for children weighing more than 20 pounds, but not more than 50 pounds will be tested with an anthropomorphic dummy representing a 3-year-old child.

On May 18, 1978, NHTSA published a notice of proposed rulemaking for the anthropomorphic test dummy amendment (43 FR 21490) and the child restraint standard (43 FR 21470). The comment closing date for both notices was December 1, 1978. The May 18, 1978, proposal on the anthropomorphic dummies noted that the calibration requirements proposed for the 3-year-old child test dummy were tentative. The agency said it would continue further testing on the calibrations and the results of that work would be placed in the public docket as soon as possible after the testing was completed. Based on the testing, NHTSA tentatively decided to make several minor modifications to the test dummy specifications and calibration requirements to improve the accuracy of the test dummy as a tool for measuring the performance of child restraints. A copy of the modifications was placed in the public docket on September 27, 1978, and the dummy manufacturers and child restraint testing facilities were advised of the modifications. The tentative modifications were published in the *Federal Register* on November 16, 1978 (43 FR 53478).

At the request of the Juvenile Products Manufacturers Association, the agency extended the comment closing date until January 5, 1979, for the portions of the child restraint and test dummy proposals dealing with testing with the anthropomorphic dummies. NHTSA granted the extension because manufacturers were reportedly having problems obtaining the proposed test



dummies to conduct their own evaluations. Based on information gathered by the agency about the availability of testing facilities and dummies, the agency concluded that manufacturers could conduct the necessary testings before the extended comment closing date.

On December 21, 1978, NHTSA made available one of the agency's test dummies to General Motors Corp. (GM) for the purpose of resolving certain calibration problems GM reported it had experienced with its own test dummy. All other interested parties also were advised of the availability of the NHTSA test dummy and informed that NHTSA did not plan to issue a final rule on the test dummy proposal until at least mid-summer. The agency said it would review additional testing material submitted to the docket before issuance of the final rule. The final rule issuance date was subsequently rescheduled for October 1979 in the Department's March 1, 1979, Semi-Annual Regulations Agenda (44 FR Part II, 38) and for November 1979 in the August 27, 1979 Agenda (44 FR 50195).

Following issuance of the May 1978 notice of proposed rulemaking, NHTSA conducted additional testing of the test dummies. This testing, completed in July 1979, further confirmed the results of the agency's prior testing which showed the anthropomorphic dummies to be objective test devices. The results of this testing were periodically placed in the public docket so that all interested parties could comment on them.

This final rule is based on the data obtained in the agency's testing, data submitted in the comments, and data obtained from other pertinent documents and test reports. Significant comments submitted to the docket are addressed below.

#### **Infant Test Dummy**

The infant test dummy is based on a simple design representing the dimensions and mass distribution characteristics of a 6-month-old child. The test dummy is used to assess the ability of infant restraints to retain their occupants and maintain their structural integrity during dynamic testing. Because of its construction, the dummy cannot be instrumented to measure the forces that would be exerted upon an infant in a crash. NHTSA's tests have shown the infant dummy will reliably and consistently represent the dynamics of an infant during simulated impact tests.

GM, the only party to comment on the specification for the infant test dummy, reported that it had "no significant problem in building or verifying the compliance of the dummy to the proposed specification." To improve the durability of the test dummy, GM recommended adding a wooden form to the head to maintain its geometry and using steel instead of lead for ballast in the test dummy. Since these recommendations should not affect the dummy's performance and should increase its durability, NHTSA has adopted a modified version of the proposed changes. The changes add a plastic form to the dummy's head, since a plastic form is easier to manufacture and duplicate than a wooden form. In addition, a portion of the ballast materials are now required to be steel and aluminum.

The revised design drawings and a construction manual for the infant dummy are available for examination in the NHTSA docket section, which is open from 7:45 a.m. to 4:15 p.m., Monday through Friday. Copies of these documents can be obtained from: Keuffel and Esser Co., 1512 North Danville Street, Arlington, Virginia 22201.

#### **3-Year-Old Child Test Dummy**

The test dummy representing a 3-year-old child is based on the Alderson Model VIP-3C test dummy. It was chosen over the other available test dummies representing a 3-year-old child, such as the Sierra 492-03 test dummy, because it has more complete design details, can adequately withstand the test load imposed during impact testing, has more accurate anthropometry and mass distribution, can be easily instrumented for testing, more closely simulates the responses of a child during impact testing and has more consistent head and chest acceleration measurements during impact testing.

As with the infant test dummy, the final rule establishes a complete set of design specifications for the 3-year-old test dummy. For the 3-year-old test dummy, NHTSA has provided: a drawing package containing all of the technical details of the dummy parts and the stages of dummy manufacture; a set of master patterns for all molded and cast parts of the dummy; and a maintenance manual containing instructions for the assembly, disassembly, use, adjustment and maintenance of the dummy. These materials will ensure that manufacturers can accurately and consistently produce the test dummy.

The drawings and the maintenance manual for the 3-year-old test dummy are available for examination at the agency's docket section. Copies of these drawings and the maintenance manual can be obtained from the Keuffel and Esser Co., 1512 North Danville Street, Arlington, Va. 22201. In addition, patterns for all the cast and molded parts are available on a loan basis from the agency's Office of Vehicle Safety Standards, at the address given at the beginning of this notice.

### Calibration Requirements

Unlike the infant test dummy, the 3-year-old child test dummy can be instrumented with accelerometers to measure the forces imposed on the dummy during an impact. Thus, in Standard No. 213, *Child Restraint Systems*, the 3-year-old test dummy is used to measure the amount of head and knee excursion and the magnitude of head and chest acceleration allowed by the child restraint.

Since a test dummy is a complex instrument required to measure important parameters, it is essential that the test dummy be properly calibrated to ensure accurate and repeatable results. NHTSA has developed detailed test dummy specifications and instrumentation requirements to ensure that the test dummies are as much as possible identically constructed and identically instrumented. The agency also developed calibration performance requirements that the test dummy must meet in dynamic and static tests. The calibration tests will determine whether the test dummies are uniformly constructed and properly instrumented.

In its comments, GM reported that it was unable to calibrate its 3-year-old test dummies. As mentioned previously, NHTSA loaned GM one of the agency's test dummies for the purpose of resolving the reported calibration problem. Using the NHTSA test dummy equipped with NHTSA's accelerometers, GM was able to meet the peak resultant acceleration requirements set for the dummy's head in specified pendulum impact tests, but was not able to meet the lateral acceleration requirement. When the same dummy was tested with GM's accelerometers, the dummy did not meet any of the head acceleration performance requirements. In the case of the chest calibration performance requirements, the accelerations measured by GM test dummies and the NHTSA test dummy, using both GM's and NHTSA's accelerometers, were within the range set for peak resultant and lateral acceleration.

GM also said that because the agency did not define the term "unimodal" it was not certain that the acceleration measurements that it made complied with the requirement that the acceleration-time curves for the head and chest impacts be unimodal. To clarify the requirement, NHTSA has defined unimodal in the final rule to mean an acceleration curve that only has one prominent peak and has specified that the measured acceleration-time curve during the head and chest impact testing need only be unimodal during a short time period when the accelerations are above a specified level.

GM attributed the calibration problem to resonances in the head and chest of the test dummies. (A resonance is a vibrational state that can magnify the accelerations imposed on the test dummy and thus prevent the accurate measurement of those accelerations.) GM said that because of the possible inaccurate measurements caused by the resonances, the test dummy cannot be used as an objective tool for assessing the performance of child restraint systems.

The calibration testing done for the agency indicates that the acceleration responses for the head and chest pendulum impacts include a limited amount of vibration. Such responses exist to some extent in any acceleration measuring device and are also found in similar pendulum impact tests of the Part 572 adult test dummy. However, dynamic sled tests of child test dummies in child restraint systems have demonstrated that the test dummies produce very repeatable results and do not show the vibrations found in the more severe pendulum impact tests. The agency's calibration tests also show that the test dummies produce very repeatable results. Even in GM tests of its three test dummies equipped with GM's instrumentation, the test dummies produced repeatable results. Such repeatability could not be obtained with resonating systems. Based on a review of GM's and the agency's test data, NHTSA concludes that the GM calibration failures are not attributable to resonances, but are very likely due to the differences, discussed below, in the mounting of the accelerometers in the GM test dummies.

NHTSA recognizes that because of different instrumentation and test procedures, different test facilities may obtain different results in what are essentially the same tests. To reduce such differences, NHTSA proposed requirements to standardize the test and instrumentation procedures. In calibration tests conducted at Calspan



Corporation the measurements of the peak resultant head accelerations and the lateral head acceleration were found to be close to the upper limits of the tentative head calibration requirements (112 g peak resultant acceleration and 5 g lateral acceleration) proposed by the agency. To further accommodate expected differences between different testing facilities, NHTSA has decided to broaden the head acceleration calibration requirements for peak resultant head acceleration to 115 g's and for lateral acceleration to 7 g's.

#### **Instrumentation**

Based on a review of GM's and the agency's test data, NHTSA concludes that one of the significant differences between NHTSA's and GM's test dummy is the manner in which the accelerometer mounting plate is attached to the head of the test dummy. Finding what it thought was an incompatibility between the angle of the accelerometer mounting plate bolt and the angle of the surface of the plate that attaches to the dummy's head, GM changed the angle of the surface in its test dummies. However, NHTSA specified the difference in the two angles for an important reason. Having a difference in the angles allows for a firmer attachment of the accelerometer mounting plate to the dummy. The difference in the firmness of the attachment of the accelerometer mounting plate may account for the additional acceleration that occurred in the head calibration tests of the GM test dummies.

GM also asked the agency to set a torque specification for the accelerometer mounting plate bolt. In response to GM's request, the agency has added a torque specification of 10 ft. lbs. to the specifications set out in the maintenance manual for the test dummy.

GM said that another possible source of the difference between the measurements it obtained with its own test dummies and the measurements it made with the NHTSA test dummies could be due to differences in the type and location of the accelerometers in the test dummies. GM noted that the specifications proposed in the rule allow the use of different types of accelerometers by allowing a number of different accelerometer placements within the test dummy.

As explained below, testing done for the agency has shown that the use of different types of accelerometers within the permissible locations does not prevent the test dummy from producing accurate and repeatable results. However, to

further reduce the possibility of test differences due to accelerometer placement, the agency has more specifically defined several of the permissible accelerometer mounting locations.

Testing done for the agency at two different facilities to develop the calibration requirements used two types of accelerometers and different accelerometer locations. That testing produced no appreciable differences in test results and showed that different facilities could obtain repeatable results, when the accelerometers are properly mounted.

The agency's test experience with the adult test dummy also shows that minor differences in accelerometer mounting locations do not affect the ability of the test dummy to produce similar and repeatable results. The number of permissible accelerometer locations allowed for the adult test dummy is in some cases larger than the number permitted in the child test dummy. Yet no significant differences in test results for the adult test dummy have been encountered due to accelerometer location.

GM's own test data also indicate that use of different types of properly mounted accelerometers and different mounting locations produces only minor variations in the measurements. GM tested NHTSA's test dummy using two types of accelerometers mounted at different locations within the prescribed tolerances. The average measured acceleration in the chest impact tests varied by only 4 percent between the two types of accelerometers. It was only when GM used the improperly installed accelerometer mounting block in the head impact tests, discussed above, that GM obtained a 14 percent difference in measured accelerations within the NHTSA dummy using two types of accelerometers.

#### **Calibration Procedures**

GM also raised questions about the procedures for conducting the chest and head calibration tests. GM said that the sequence of procedures for positioning the dummy for the chest pendulum impact test was ambiguous since it called for the test dummy to be adjusted so that the area on the chest of the dummy immediately adjacent to the impact point is vertical. However, that surface of the dummy is curved and has variable radii. GM also pointed out that when the dummy is moved to the more vertical position, the area that a pendulum strikes the dummy also moves so that the portion of the test dummy's chest which is too rigid might be impacted. NHTSA has changed the dummy's



positioning procedures so that a plane tangent to the surface of the chest immediately adjacent to the designated impact area is vertical. The positioning of the pendulum is also changed to ensure that the pendulum consistently strikes the chest at the designated point on the chest.

GM also raised questions about the positioning of the pendulum for the head calibration impact tests. The proposed requirement specified that the impact point for the pendulum was to be measured relative to the top of the dummy's head. GM said that because of differences in the thickness and shape of the dummy's skin, the location of the impact point can vary. GM recommended determining the impact point relative to the head center of gravity reference pins which protrude through the test dummy's skin.

NHTSA has evaluated GM's proposed head impact positioning procedure and decided to adopt a modified version of it. A measurement made from the head center of gravity pins will be used to determine the head impact point to ensure that all test dummies will be struck in the same location during the head impact tests.

GM said that the lumbar spine calibration test was ambiguous because it did not specify either the direction in which the force was to be applied to the lumbar spine or the location on the spine which is to be used to define the direction of force application. GM also pointed out that the procedures erroneously set requirements for femur friction plungers which are not included in the 3-year-old test dummy. NHTSA has corrected the test procedures to specify the direction of force application and deleted the reference to friction plungers.

GM also criticized ambiguities in the specification for the amount of chest deflection. NHTSA has reevaluated the need for a chest deflection specification and has decided to eliminate the requirement, since the chest acceleration test should serve as an adequate calibration test of the dummy's chest.

#### **Repeatability**

Ford, GM and the Motor Vehicle Manufacturers Association (MVMA) raised questions about the ability of the 3-year-old test dummy to give repeatable results in crash testing. MVMA proposed that the agency conduct another series of tests to determine the amounts of variances in test results between the same dummy in several tests and between different dummies in the same tests.

MVMA and Ford also recommended that the additional testing also include testing of the proposed Economic Commission for Europe (ECE) test dummy to determine if it would be an objective test device. The agency has not conducted an evaluation of the ECE test dummy since there are no calibration requirements for that test dummy. Without calibration requirements, there is no means to ensure the accuracy of the measurements obtained by the test dummy and therefore it cannot be used as an objective test device.

The agency has already conducted three separate research programs to evaluate the 3-year-old test dummy as an objective test device. As explained below, those programs have shown that the test dummy is an objective device that produces repeatable test results.

During 1977-78, the agency had simultaneous research programs conducted at the University of Michigan's Highway Safety Research Institute and NHTSA's Vehicle Research and Test Center in East Liberty, Ohio to develop and evaluate the calibration performance requirements and test procedures for the 3-year-old test dummy. Four of the 3-year-old test dummies were used in the testing program. Two of the dummies were tested by one laboratory and the other two were tested by the other laboratory. Then the two sets of test dummies were exchanged by the laboratories and subjected to the same calibration tests. By setting up the research program in this manner, the agency was able to determine if the test procedures and calibration performance requirements were repeatable from test dummy to test dummy and from test laboratory to test laboratory. The test results from both research programs showed that the calibration test procedures and performance requirements produced repeatable results.

The repeatability of the test dummy was reaffirmed in further testing conducted between June 1978 and July 1979 at Calspan Corporation. In that research program, four of the 3-year-old test dummies were used with two different types of child restraints—one shield type (Chrysler Mopar) and one plastic shell with integral harness type (GM Love Seat). Each of the four test dummies was subjected to six sled tests at 30 mph in both types of child restraints. The harness type restraint was also subjected to 3 sled tests at 20 mph with the top tether strap unattached.

To determine the repeatability of the test dummies, the head and chest accelerations and the amounts of head and knee excursion experienced

by the test dummies were analyzed. That analysis showed that the amount of deviation measured by the same dummy in the different tests was small and similar in nature to the results obtained with Part 572 test dummies representing adults, which have been established as objective test devices.

In addition to examining the results obtained for the same dummy in different tests, the research program also examined the results for each of the four 3-year-old dummies in the same test. Based on previous testing of test dummies representing adults, it was determined that if the absolute deviation of the observed test results for each performance criteria, such as head acceleration, was less than six percent from the mean results, then the dummies had sufficient repeatability. In all but one of the test results, the deviation from the mean was less than six percent. The single exception involved the amount of chest acceleration measured in the test dummies in the 20 mph tests of an untethered harness-type restraint. In that instance the deviation was only 7.7 percent. The reason for the variation in that test is probably due to the increased movement of the seat because the tether strap was unattached, rather than due to any variability in the test dummy.

#### Costs

The agency has considered the economic and other impacts of this final rule and determined that this rule is not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this final rule are contained in a regulatory evaluation which has been placed in the docket. Copies of that regulatory evaluation can be obtained by writing to NHTSA's docket section at the address given in the beginning of this notice.

The cost of the infant test dummy is estimated to be approximately \$1,000. The 3-year-old test dummy should cost approximately \$4,000. The materials used in the dummies are commercially obtainable. The availability of the test dummy drawing and other specifications means that any manufacturer can produce its own test dummy and does not have to purchase the test dummy from an independent test dummy manufacturer.

Strollee, a child restraint manufacturer, and the Juvenile Products Manufacturers Association asked the agency to reconsider the calibration

requirements set for the 3-year-old dummy. They argued that the cost of calibrating the test dummy is approximately \$800 to \$1,100. Combined with the cost of the sled testing, each test of a car seat could cost approximately \$2,000–\$3,500. Such costs "would certainly discourage a manufacturer from testing frequently," Strollee said.

The calibration requirements set by this final rule are essential to ensure that the test dummy is an objective test device that will produce repeatable results in dynamic sled tests. So that the requirements would be practicable, the agency established the minimum number of calibration tests possible which would still ensure that the test dummy is properly constructed and properly instrumented. Each manufacturer, in the exercise of due care, must determine how frequently it will calibrate its test dummy and how frequently it will run tests to determine its child restraint's compliance with Standard No. 213.

In its own testing, the agency has used some test dummies in as many as 15 tests over a 2–3 week period without recalibrating them and has not found any difference in their performance. With other test dummies, the agency has found it necessary to recalibrate them after several tests. However, in its compliance testing the agency will use properly calibrated dummies.

The principal authors of this notice are Vladislav Radovich, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

In consideration of the foregoing, Part 572, *Anthropomorphic Test Dummies*, of Title 49 of the Code of Federal Regulations is amended as follows:

1. A new subsection (c) is added . . . Subpart A—General, Section 572.4 Terminology (49 CFR 572.4) to read as follows:

- (c) The term "unimodal", when used in Subpart C, refers to an acceleration-time curve which has only one prominent peak.

2. A new Subpart C—Three Year Old Child, is added . . .

Issued on December 20, 1979.

Joan Claybrook  
Administrator

**44 F.R. 76527**  
**December 27, 1979**



## PREAMBLE TO AN AMENDMENT TO PART 572

### Anthropomorphic Test Dummies (Docket No. 78-9, Notice 5; Docket No. 73-8, Notice 9)

**ACTION:** Final rule.

**SUMMARY:** This notice amends Part 572, Anthropomorphic Test Dummies, to allow the use of an alternative chemical foaming agent for molding the dummy's flesh parts. In response to a Ford petition, the notice also makes a minor technical amendment to modify one specification in the calibration procedures for the neck of the test dummy representing a 50th percentile male. The effect of the latter amendment is to simplify the calibration test.

**DATES:** The amendment is effective on June 16, 1980.

**ADDRESSES:** Petitions for reconsideration should refer to the docket numbers and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours: 8:00 a.m. to 4:00 p.m.)

**FOR FURTHER INFORMATION CONTACT:**

Mr. Vladislav Radovich, Office of Vehicle Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:** This notice amends Part 572, Anthropomorphic Test Dummies, to modify the design specification for molding the test dummy's flesh parts to allow the use of an alternative chemical foaming agent, "OBESH/TBPP," to the currently specified "Nitrosan." In response to a petition from the Ford Motor Company, the agency is also making a minor technical amendment to simplify the calibration test for the neck used in the 50th percentile male test dummy. The amendment deletes the current specification and substitutes the specification used in the calibration testing of the recently issued three-year-old child test dummy (44 FR 76527,

December 27, 1979).

The agency published the proposed changes to the flesh molding and neck calibration specifications in the *Federal Register* of December 18, 1978 (43 FR 58843). Only one party, Ford Motor Co., commented on the proposed changes and Ford supported the adoption of both proposed changes.

#### Molding Specifications

The agency proposed the changes in the molding specification because the sole manufacturer of "Nitrosan," the currently specified chemical foaming agent, has discontinued its production due to the hazardous propensities of the compound during its manufacturing process. Based on an extensive research program to develop and test new chemical foaming agents (which was fully described in the notice of proposed rulemaking), the agency found that test dummy flesh parts made from "OBESH/TBPP" have comparable material properties to those produced with "Nitrosan" and are superior in some respects. Based on an evaluation of the research results, the agency concludes that flesh parts produced from "OBESH/TBPP" can be used for all purposes for which test dummies are required by the applicable safety standards and the dummy performance will be equivalent to the performance of dummies produced with "Nitrosan." Therefore, the agency is amending the regulation to allow the use of "OBESH/TBPP."

Drawings and specifications outlining the formulations for molding dummy flesh parts with the "OBESH/TBPP" compound are available for examination in NHTSA Docket 73-8 and Docket 78-9, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590. Copies of these drawings may also be obtained from the Keuffel and Esser Company, 1513 North Danville Street, Arlington, Virginia 22201.

#### Neck Calibration Requirements

In response to a request from Ford, the agency



proposed an amendment to the pendulum impact test specification established in section 572.7(b) for the calibration of the 50th percentile male test dummy. The amendment would have replaced the current specification with the specification for calibration testing established for the 3-year old child test dummy.

The pendulum neck test found in Subpart B of the standard for the 50th percentile male dummy is intended to measure the bending properties of the dummy's neck. The current test specifies that, during the neck bending procedure, the pendulum shall not reverse direction until "T = 123 ms." This means that from the time the pendulum contacts the arresting material which it must strike, the pendulum cannot reverse direction for 123 milliseconds. The original intent of this requirement was to negate the effects of arresting material having rebound characteristics that could force the pendulum to reverse its motion before the bending properties of the neck could be measured. Ford requested a change in this specification because in certain instances the use of a special apparatus may be required to hold the pendulum arm for at least 123 milliseconds after the pendulum has impacted the arresting material.

Research by NHTSA and the industry has shown that when appropriate crushable materials are used in pendulum impact tests, the pendulum does not reverse its motion until the neck has straightened out and the head's center of gravity has returned to its original zero-time position relative to the pendulum. At that time, all measurements of the neck bending characteristics are completed and the pendulum's motion thereafter is inconsequential. In light of this research, the recent addition of Subpart C to Part 572, specifying requirements for the 3-year-old child dummy, modified the language concerning reversal of the pendulum arm during the neck impact test. Section 572.17 of that subpart specifies that "the pendulum shall not reverse direction until the head's center of gravity returns to the original zero time position relative to the pendulum arm." Under this requirement, a dummy user could only use an arresting material for the impact test whose rebound characteristics would not overcome the pendulum's inertia before the head and neck returned to the zero time position.

Since the specification in Subpart C of Part 572 represents a simplification of the pendulum

impact test specified in the current Subpart B, without any degradation of performance characteristics, the agency is amending section 572.7(b) of Subpart B to read as section 572.17(b) of Subpart C.

#### Costs

The agency has considered the economic and other impacts of this final rule and determined that this rule is not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. Based on that assessment, the agency has concluded also that the economic and other consequences of this proposal are so minimal that a regulatory evaluation is not necessary. The impact is minimal since there is no estimated increase in the cost of the test dummies due to the change in the foaming agent and neck calibration specification. In addition, the amendments would have no adverse environmental effects.

The engineer and lawyer primarily responsible for this notice are Vladislav Radovich and Stephen Oesch, respectively.

In consideration of the foregoing, Part 572, Anthropomorphic Test Dummies, of Title 49 of the Code of Federal Regulations is amended as follows:

1. Technical drawing ATD-6070 incorporated by reference in Section 572.15 of Subpart C—3-Year-Old-Child is amended to add the formulation for "OBSh/TBPP" foaming compound.
2. Technical drawing ATD-7151 incorporated by reference in Section 572.5 of Subpart B—50th Percentile Male is amended to add the formulation for "OBSh/TBPP" foaming compound.
3. The last sentence of Section 572.7(b) of Subpart B—50th Percentile Male is amended to read: "The pendulum shall not reverse direction until the head's center of gravity returns to the original zero time position relative to the pendulum arm."

Issued on June 9, 1980.

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Joan Claybrook  
Administrator

45 FR 40595  
June 16, 1980

## PREAMBLE TO AN AMENDMENT TO PART 572

### Anthropomorphic Test Dummies Representing 6-month-old and 3-year-old Children (Docket No. 78-09; Notice 6)

**ACTION:** Response to petition for reconsideration.

**SUMMARY:** This notice grants in part and denies in part a General Motors (GM) petition for reconsideration of the 3-year-old test dummy requirements set in Part 572, Anthropomorphic Test Dummies. GM said it could not calibrate its test dummies because of resonances in the dummies, which prevent accurate acceleration measurements. NHTSA found that GM's calibration problems are due to its failure to comply with all of the design specifications set for the dummy and its use of single axis rather than triaxial accelerometers. In another notice in today's *Federal Register* the agency is proposing to require the use of triaxial accelerometers. This notice also corrects typographical errors in the final rule.

**DATES:** The amendments are effective on June 26, 1980.

**FOR FURTHER INFORMATION CONTACT:**

Mr. Vladislav Radovich, Office of Vehicle  
Safety Standards, National Highway Traffic  
Safety Administration, 400 Seventh Street,  
S.W., Washington, D.C. 20590 (202-426-2264)

**SUPPLEMENTARY INFORMATION:** On December 27, 1979, NHTSA published in the *Federal Register* a final rule amending Part 572, Anthropomorphic Test Dummies, to establish specifications and performance requirements for two test dummies, one representing a 6-month-old child and the other representing a 3-year-old child (44 FR 76527). The dummy is used in testing child restraint systems in accordance with Federal Motor Vehicle Safety Standard No. 213, Child Restraint Systems. General Motors (GM) timely filed a petition for reconsideration concerning the specifications and performance requirements set

for the test dummy representing a 3-year-old child. No other petitions were filed and GM raised no issues concerning the specifications set for the test dummy representing a 6-month-old child.

In its petition, GM again argued that the 3-year-old test dummy is not an objective test device for acceleration measurement because of resonances in the test dummy. GM requested the agency not to use the dummy as an acceleration measurement device until the resonances are eliminated.

GM also asked the agency to revise its accelerometer specifications to require the axes of triaxial accelerometers to intersect at a single point. GM said the change would reduce possible variability between different types of accelerometers. In addition, GM requested a further change in the lumbar spine test procedures to permit the use of either a pull or a push force during the spine calibration tests.

GM also raised questions about the possible use of different signal filtering techniques at different test laboratories. GM said that the use of different filters might account for differences between its testing and testing done for the agency.

NHTSA has evaluated GM's comments and the agency's responses to GM's petition are discussed below. All requests that are not specifically granted below are denied.

#### Signal Filtering

GM argued that one of the possible reasons for the differences between the test dummy head calibration test results at GM and other laboratories was the use of incorrect filters (devices used in the electronic processing of the acceleration measurements) by some laboratories. Part 572 requires the acceleration measurements to be filtered according to the Society of Automotive Engineers Recommended Practice J211a. Both Calspan Corporation and the agency's Vehicle Research and Test Center (VRTC), which did



testing for NHTSA, used the required filter and instrumented their test dummies with triaxial accelerometers. The test results at VRTC were all within the limits set by the agency.

The Calspan test results originally reported to the agency were also within the limits. In rechecking its data, however, Calspan determined that it had made an error in calculating the peak resultant accelerations in the head calibration test. The corrected data showed that in one of the four head calibration tests the peak resultant acceleration was 116 g's, which exceeds the 115 g limit set in Part 572. To evaluate possible variability in the processing of the data by different laboratories, the agency also had HSRI and VRTC process the Calspan data. For the tests which exceeded the calibration limit, there was little variability between the different laboratories, with HSRI measuring 118 g's and VRTC measuring 117.4 g's.

The dummies Calspan used in the calibration testing were subsequently used in sled tests of child restraint systems. In the sled tests, the dummies provided consistent and repeatable acceleration measurements. Since dummies that experience 118 g's in the head calibration test can provide consistent and repeatable acceleration measurements, the agency, in a separate notice appearing in today's *Federal Register*, is proposing to increase the head resultant acceleration calibration limit from 115 to 118 g's.

NHTSA has found that the University of Michigan's Highway Safety Research Institute (HSRI), which instrumented its dummies with single axis accelerometers, did not use the filter required by Part 572, but instead used a filter that deviates from the required filter. To determine whether the use of the HSRI filter made a difference in the calibration tests conducted by that laboratory, the agency had HSRI process the accelerations recorded during its head calibration tests with the correct filter. Using the correct filter, HSRI found that in five of the eighteen head calibration tests the peak resultant acceleration exceeded the limits set in Part 572. In those five tests, the peak resultant acceleration ranged from 115.9 to 119.1 g's.

The peak resultant accelerations and the shape of the acceleration pulses in the HSRI tests that exceeded the calibration limit were smaller than and not the same shape as the measurements made by GM in its tests, which also used test

dummies instrumented with single axis accelerometers. In the two sets of data submitted by GM to the docket, the peak resultant accelerations ranged from 119 to 130 g's. In addition, the shape of the GM head acceleration pulse was different than the pulses measured in all the testing done for the agency. In the GM acceleration pulse, there is a brief secondary peak after initial peak is reached. Based on the agency's testing of adult test dummies, such secondary peaks are usually indications of accelerometer vibration resulting from improper installation.

The differences between the GM testing and the testing done for the agency is not attributable to the use of different filters. When all the test data is filtered as specified in the standard, the peak resultant accelerations measured by GM are still greater than those obtained at the other three laboratories. As explained below, use of triaxial accelerometers, rather than the single axis accelerometers used by GM and HSRI, will provide repeatable, complying results in the head calibration test.

#### Instrumentation

Part 572 allows the use of two different types of accelerometers (single axis and triaxial) in the test dummy and sets different axis intersection requirements for each type of accelerometer. GM asked the agency to apply the axis intersection requirements set for single axis accelerometers to triaxial accelerometers. It said such a requirement would reduce the variability in test measurements resulting from use of different types of accelerometers.

The agency's testing has demonstrated that variability can be sufficiently controlled by use of the existing specification with a triaxial accelerometer. Testing done by GM has also shown that the test dummy can be properly calibrated with triaxial accelerometers. When GM tested one of the agency's test dummies with GM's accelerometer mounting place and single axis accelerometers, the peak lateral accelerations measured in the test dummy's head exceeded the limits currently set in the regulation. Yet when GM tested the same test dummy equipped with triaxial accelerometers placed on the mounting plate required by the design specifications, the test dummy easily met the calibration requirements. Therefore, rather than adopt GM's proposal, the



agency is proposing, elsewhere in today's *Federal Register*, to require the use of only triaxial accelerometers.

### Resonances

GM said that "the consistent lack of correlation between dummy tests at General Motors and at other laboratories" was attributable to resonances in the test dummy. It said the dummy could not be used as an objective test device until the resonances were eliminated. As explained previously, the variability between different test laboratories can be controlled by the use of triaxial accelerometers.

One reason for the "resonances" in the GM test results may be GM's failure to use dummies that fully comply with the agency's design specifications. The agency's review of some of the blueprints used in the construction of the GM test dummies revealed that GM did not use the accelerometer mounting plate required by the NHTSA design specifications. The mounting plate used by GM was smaller and presumably lighter than the plate specified by the agency. Use of a smaller and lighter plate may have also contributed to the higher acceleration readings obtained by GM.

Thus, the agency denies GM's request not to use the dummy for acceleration measurement and concludes that the 3-year-old test dummy instrumented with triaxial accelerometers is an objective test device for measuring accelerations in child restraints.

### Spine Calibration

The calibration requirements for the lumbar spine of the test dummy specify the amount of flexion the spine must experience when force is applied to it. The calibration procedures specify that the applied force is to be applied as a pull force. GM requested the agency to permit the use of a "push" force saying that it "is more convenient to apply in some test set-ups."

When the agency developed the spine calibration tests, both pull and push forces were used to apply force to the spine. However, the testing done by the Highway Safety Research Institute (HSRI) found that use of a push force "proved to be awkward and inconsistent." HSRI also found that use of a pull force was simpler procedure and provided consistent data. Based on the HSRI

testing, the agency has decided to deny GM's request since the use of a pull force provides a simple, repeatable method to measure compliance.

### Corrections

In the final rule issued on December 12, 1979, NHTSA amended the instrumentation requirements for the chest to more specifically define several of the accelerometers mounting locations. The revised specifications inadvertently reversed two of the axis mounting locations in the chest. The specifications have been amended in this notice to correct that error.

The test procedure for conducting the head impact test set forth in the final rule contained a typographical error. The tolerance for positioning the test probe was listed as  $\pm 1.1$  inches. The regulation has been amended in this notice to specify the correct tolerance of  $\pm 0.1$  inches.

The performance requirement for the neck calibration test was incorrectly listed as 84 degrees  $\pm 18$  degrees rather than the correct figure of 84 degrees  $\pm 8$  degrees. The necessary corrections have been made in this notice to the regulation.

The principal authors of this notice are Vladislav Radovich, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

In consideration of the foregoing, Subpart C—3-Year-Old Child of Part 572, Anthropomorphic Test Dummies, of Title 49 of the Code of Federal Regulations, is amended as follows:

1. Section §572.1(c)(2) is amended to read as follows:

(2) Adjust the test probe so that its longitudinal centerline is at the forehead at the point of orthogonal intersection of the head midsagittal plane and the transverse plane which is perpendicular to the "Z" axis of the head (longitudinal centerline of the skull anchor) and is located  $0.6 \pm 0.1$  inches above the centers of the head center of gravity reference pins and coincides within 2 degrees with the line made by the intersection of horizontal and midsagittal planes passing through this point.

2. The first sentence of section §572.17(b) is amended to read as follows:

(b) When the head-neck assembly is tested in accordance with paragraph (c) of this section, the head shall rotate in reference to the pendulum's longitudinal centerline a total of 84 degrees  $\pm 8$  degrees about its center of gravity, rotating to the

extent specified in the following table at each indicated point in time, measured from impact, with the chordal displacement measured at its center of gravity.

3. Section §572.21(c) is amended to read as follows:

(c) Accelerometers are mounted in the thorax on the mounting plate attached to the vertical transverse bulkhead shown in the drawing subreferenced under assembly No. SA 103C 030 in drawing SA 103C 001 so that their sensitive axes are orthogonal and their seismic masses are positioned relative to the axial intersection point located in the midsagittal plane 3 inches above the top surface of the lumbar spine and 0.3 inches dorsal to the accelerometer mounting plate surface. Except in the case of triaxial accelerometers, the sensitive axes shall intersect at the axial intersection point. One accelerometer is aligned with its sensitive axis parallel to the vertical bulkhead and midsagittal planes, and with its seismic mass center at any distance up to 0.2 inches to the left, 0.1 inches inferior and 0.2 inches ventral of the axial intersection point. Another accelerometer is aligned with its sensitive axis in the transverse

horizontal plane and perpendicular to the midsagittal plane and with its seismic mass center at any distance up to 0.2 inches to the right, 0.1 inches inferior and 0.2 inches ventral to the axial intersection point. A third accelerometer is aligned with its sensitive axis parallel to the midsagittal and transverse horizontal planes and with its seismic mass center at any distance up to 0.2 inches superior, 0.5 inches to the right and 0.1 inches ventral to the axial intersection point. In the case of a triaxial accelerometer, its axes are aligned in the same way that the axes of three separate accelerometers are aligned.

Issued on June 17, 1980.

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Joan Claybrook  
Administrator

**45 FR 43352**  
**June 17, 1980**

## PREAMBLE TO AN AMENDMENT TO PART 572

### Anthropomorphic Test Dummies (Docket No. 78-09; Notice 8)

**ACTION:** Response to petitions for reconsideration, final rule and correction.

**SUMMARY:** This notice amends Subpart C of Part 572, Anthropomorphic Test Dummies, to specify the use of a triaxial accelerometer in the test dummy representing a 3-year-old child. The use of a triaxial accelerometer will eliminate calibration problems associated with single axis accelerometers. The notice also denies petitions filed by Ford Motor Company and General Motors Corporation seeking reconsideration of the agency's June 26, 1980 notice responding to a prior General Motors Corporation petition for reconsideration. Finally, the notice corrects a typographical error in the agency's June 26, 1980 final rule.

**DATES:** The amendments are effective on December 15, 1980.

**ADDRESSES:** Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

#### FOR FURTHER INFORMATION CONTACT:

Mr. Vladislav Radovich, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590  
(202-426-2264)

**SUPPLEMENTARY INFORMATION:** This notice amends Subpart C of Part 572, Anthropomorphic Test Dummies, to change several of the requirements for the test dummy representing a 3-year-old child. The test dummy is used in testing child restraint systems in accordance with Federal

Motor Vehicle Safety Standard No. 213, Child Restraint Systems.

The notice amends Subpart C of Part 572 to specify the use of triaxial accelerometers, instead of single axis accelerometers, in the head and chest of the test dummy. In addition the notice increases the upper limit for permissible resultant acceleration in the head calibration test from 115 g's to 118 g's. The agency published a notice proposing these changes in the *Federal Register* for June 26, 1980 (45 FR 43355). Only two parties, Ford Motor Company (Ford) and General Motors Corporation (GM), submitted comments on the proposal. The final rule is based on the data submitted in those comments, data obtained in the agency's testing and data obtained from other pertinent documents. Significant comments submitted to the docket are addressed below.

This notice also denies petitions filed by Ford and GM seeking reconsideration of the agency's June 26, 1980 notice (45 FR 43352) that granted in part and denied in part a prior GM petition for reconsideration.

Finally, this notice corrects a typographical error in an amendment made in the agency's June 26, 1980 notice (45 FR 43352) responding to a prior GM petition for reconsideration.

#### Resonances

Ford and GM both agree with the agency that the test dummy representing a 3-year-old child is an objective test device for measuring the amount of head and knee excursion that occurs in child restraint system testing using the test dummy. The fundamental disagreement stated in the Ford and GM comments and petitions for reconsideration is whether the test dummy is an objective test device for measuring accelerations in the dummy's head and chest during child restraint testing. GM argues that the test dummy is not an objective



device because of the presence of resonances in the head and chest of the test dummy. Ford says that the test dummy "may be a suitable measuring device, when there is no head impact (such as in a shoulder harness type of child restraint)" during child restraint testing. It, however, argues that if there is a head impact in the child restraint testing, then the test dummy's head will resonate.

Ford and GM both argue that the resonances can reinforce or attenuate the measurement of impact forces on the test dummy. Thus, if the test dummy does resonate, the acceleration measured in the test dummy may not represent the actual forces experienced by the test dummy.

Ford argues that the source of the resonance is an oscillation of the urethane skull of the test dummy. Ford included with its petition and comments on the June 26, 1980 proposal the results of several tests in which it struck the head of the test dummy with a rubber mallet. Ford said that regardless of the direction of the impact, the head resonated with a frequency of approximately 200 Hertz (Hz) when it was struck.

The agency has reviewed the Ford and other test data and concluded that the test dummy is an objective test device that can be used for measuring accelerations. As explained below, the agency's conclusion is based on an analysis of the structure of the test dummy's head and chest and the relationship between that structure and the impact response of the test dummy.

Many physical structures, such as the test dummy's head, have a natural or resonating frequency at which they will vibrate when they are driven by a force of the same frequency. When resonance occurs, small variations in the applied force can produce large variations in the measured acceleration, thus preventing accurate measurement of the acceleration. The resonance, however, will not occur if the driving force is of a frequency that is below the natural or resonating frequency of the object being struck.

Analysis of the test dummy shows that the natural or resonating frequency of the head is approximately 128 Hz, while the natural frequency of the accelerometer attachment in the test dummy's head is approximately 255 Hz. The natural resonating frequencies of the test dummy's chest and chest accelerometer attachment are approximately 85 Hz and 185 Hz.

Impacts with hard and unyielding objects, such

as the unpadded portion of a car's instrument panel, can create high frequencies, generally up to 1,000 Hz. Impacts with soft and yielding surfaces, such as a padded child restraint, create low frequencies, generally less than 50 Hz.

The test used in Standard No. 213 to evaluate child restraints does not include impacts with hard and unyielding surfaces. In Standard No. 213 testing, the child restraint is placed on a vehicle seat and attached by a lap belt. There is no portion of a vehicle's interior, such as an instrument panel, placed in front of or to the side of the vehicle seat. Thus, during the testing, the dummy will contact the belts or padded surfaces of the child restraint. Since the belts and padded surfaces are yielding and energy-absorbing, contact with them will involve impacts where the frequencies are well below the natural or resonating frequency of the test dummy's head and chest.

Ford raised the issue of whether contact between the head and arms of the dummy during the testing might produce frequencies that will cause the test dummy's head to resonate. Ford said that it had experienced dummy head and arm contact in some of its tests and resonance occurred.

The agency has conducted more than 150 tests of child restraint systems. There have only been 2 tests in which the head of the test dummy struck the toes and resonances occurred. The head-limb contact occurred in those tests because of massive structural failures in the child restraint system.

Although resonances did occur when the head struck the toes, the validity of the acceleration measurement in those tests is irrelevant for determining if the child restraint complied with Standard No. 213, Child Restraint Systems. The structural failure is, by itself, a violation of the standard. The agency had not found head and limb contact affecting acceleration measurements in any child restraint that maintained its structural integrity during the testing.

In the past several years, the agency has conducted 10 tests of the Ford TOT GUARD. In one of those tests, the arm briefly touched the head, but there was no effect on the acceleration measurement. The dummy in those tests was positioned in accordance with the test procedure set out in Standard No. 213. Since the test procedure permits the limbs to be positioned so that they will not inhibit the movement of the head or torso the agency looked at the effect of positioning the dum-

my's arm in different locations on the shield or the side of the TOT GUARD. None of the different arm positions resulted in head to arm contact affecting acceleration measurement.

### **Triaxial Accelerometers**

Part 572 currently allows the use of either triaxial accelerometers or single axis accelerometers to measure accelerations in the head and chest of the 3-year-old child test dummy. The June 26, 1980 notice (45 FR 43355) proposed specifying the use of only triaxial accelerometers in the test dummy to eliminate calibration problems caused by single axis accelerometers. The agency proposed only using triaxial accelerometers after GM was unable to calibrate its test dummies with single axis accelerometers. In GM's head calibration tests, the peak resultant acceleration exceeded the upper limit set by the regulation.

GM agreed that use of a triaxial accelerometer "may reduce the possibility of exceeding the peak acceleration in the dummy calibration test." It, however, argued that the use of triaxial accelerometers will not solve the problem of resonance. As previously explained, the types of impacts experienced in child restraint testing will not produce resonances. The purpose of requiring the use of triaxial accelerometers is to enable manufacturers to calibrate consistently their test dummies within the acceleration limits set in the regulation.

Ford argued that single axis accelerometers are easier to work with, more reliable and more easily repaired than triaxial accelerometers. The agency is not aware of any data, and Ford supplied none, indicating that triaxial accelerometers are less reliable than single axis accelerometers. Contrary to Ford's assertion, a triaxial accelerometer should be easier to use. The axes and seismic mass center of the triaxial accelerometer (Endevco model 7267C-750) currently used in dummy testing are permanently fixed in a mounting block. With single axis accelerometers, three separate accelerometers must be positioned by each user on a mounting block in order to instrument the dummy. Thus the possibility of variation in mounting location between different users is increased by the use of single axis accelerometers.

Single axis accelerometers are more readily repairable than triaxial accelerometers. The agency, however, has used triaxial accelerometers in

numerous dummy tests for several years and has found that their repair experience is comparable to single axis accelerometers.

Based on all these considerations, the agency has decided to adopt the triaxial accelerometer requirement as proposed.

### **Calibration Limit**

To accommodate minor variation in test measurements between different test laboratories, the agency's June 26, 1980 notice (45 FR 43355) proposed to slightly increase the permissible resultant acceleration limit for the head calibration test from 115 g's to 118 g's. Neither Ford nor GM opposed this change, so the agency is adopting it as proposed. Although the agency is expanding the upper limit of the calibration range, experience with the Part 572 adult test dummy has shown that manufacturers will develop production techniques to produce test dummies that have acceleration responses that fall within the middle of the specified calibration range.

### **Correction**

The final rule established by the agency's June 26, 1980 notice (45 FR 43352) amended the head calibration head test procedures. The notice inadvertently made the amendment to section 572.1(c)(2) of Part 572 instead of to section 572.16(c)(2). This notice corrects that typographical error and makes the amendment to section 572.16(c)(2).

### **Costs**

The agency has considered the economic and other impacts of this final rule and determined that this rule is not significant within the meaning of Executive Order 12221 and the Department of Transportation's policies and procedures implementing that order. Based on that assessment, the agency has concluded that the economic and other consequences of this rule are so minimal that a regulatory evaluation is not necessary. The impact is minimal since the primary effect of this rule is to bind the agency to using one of the two types of accelerometers formerly permitted by the regulation. The economic impact on manufacturers choosing to purchase triaxial accelerometers needed to instrument the dummy is approximately \$2,500.

The agency finds, for good cause shown, that it is in the public interest that the amendments made



by this notice have an immediate effective date. The immediate effective date is needed since the test dummy will be used in conducting compliance tests for Standard No. 213, Child Restraint Systems, which goes into effect on January 1, 1981.

The engineer and lawyer primarily responsible for this notice are Vladislav Radovich and Stephen Oesch, respectively.

In consideration of the foregoing, Subpart C of Part 572, Anthropomorphic Test Dummies, of Title 49 of the Code of Federal Regulations is revised to read as follows:

1. The first sentence of section 572.16(b) is revised to read as follows:

(b) When the head is impacted in accordance with paragraph (c) of this section by a test probe conforming to §572.21(a) at 7 fps., the peak resultant acceleration measured at the location of the accelerometer mounted in the headform in accordance with §572.21(b) shall be not less than 95g and not more than 118g.

2. Section 572.21(b) is revised to read as follows:

(b) A triaxial accelerometer is mounted in the head on the mounting block (A/310) located on the horizontal transverse bulkhead as shown in the drawings subreferenced under assembly SA 103C 010 so that its seismic mass centers are positioned as specified in this paragraph relative to the head accelerometer reference point located at the intersection of a line connecting the longitudinal centerlines of the transfer pins in the sides of the dummy head with the midsagittal plane of the dummy head. The triaxial accelerometer is aligned with one sensitive axis parallel to the vertical bulkhead and midsagittal plane and its seismic mass center is located 0.2 inches dorsal to and 0.1 inches inferior to the head accelerometer reference point. Another sensitive axis of the triaxial accelerometer is aligned with the horizontal plane and is perpendicular to the midsagittal plane and its seismic mass center is located 0.1 inch inferior to, 0.4 inches to the right of and 0.9 inch dorsal to the head accelerometer reference point. The third sensitive axis of the triaxial accelerometer is aligned so that it is parallel to the midsagittal and horizontal planes and its seismic mass center is located 0.1 inches inferior to, 0.6 inches dorsal to and 0.4 inches to the right of the head accelerometer reference point. All seismic mass centers shall be positioned within  $\pm 0.05$  inches of the specified locations.

3. Section 572.21(c) is revised to read as follows:

(c) A triaxial accelerometer is mounted in the thorax on the mounting plate attached to the vertical transverse bulkhead shown in the drawing subreferenced under assembly No. SA 103C 030 in drawing SA 103C 001 so that its seismic mass centers are positioned as specified in this paragraph relative to the thorax accelerometer reference point located in the midsagittal plane 3 inches above the top surface of the lumbar spine and 0.3 inches dorsal to the accelerometer mounting plate surface. The triaxial accelerometer is aligned so that one sensitive axis is parallel to the vertical bulkhead and midsagittal planes and its seismic mass center is located 0.2 inches to the left of, 0.1 inches inferior to and 0.2 inches ventral to the thorax accelerometer reference point. Another sensitive axis of the triaxial accelerometer is aligned so that it is in the horizontal transverse plane and perpendicular to the midsagittal plane and its seismic mass center is located 0.2 inches to the right of, 0.1 inches inferior to and 0.2 inches ventral to the thorax accelerometer reference point. The third sensitive axis of the triaxial accelerometer is aligned so that it is parallel to the midsagittal and horizontal planes and its seismic mass center is located 0.2 inches superior to, 0.5 inches to the right of and 0.1 inches ventral to the thorax accelerometer reference point. All seismic mass centers shall be positioned within  $\pm 0.05$  inches of the specified locations.

4. The document amending Subpart C—Three-Year-Old Child of Part 572, Anthropomorphic Test Dummies, of Title 49 of the Code of Federal Regulations published in the *Federal Register* of June 26, 1980 as 45 FR 43352 is corrected by changing the reference to "Section 571.1(c)(2)" made in the first amendment to the regulation set out on page 43353 to read "572.16(c)(2)."

Issued on December 8, 1980.

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Joan Claybrook  
Administrator

45 FR 82265  
December 15, 1980



## PART 572—ANTHROPOMORPHIC TEST DUMMIES

### Subpart A—General

§ 572.1 **Scope.** This part describes the anthropomorphic test dummies that are to be used for compliance testing of motor vehicles and motor vehicle equipment with motor vehicle safety standards.

§ 572.2 **Purpose.** The design and performance criteria specified in this part are intended to describe measuring tools with sufficient precision to give repetitive and correlative results under similar test conditions and to reflect adequately the protective performance of a vehicle, or item or motor vehicle equipment, with respect to human occupants.

§ 572.3 **Application.** This part does not in itself impose duties or liabilities on any person. It is a description of tools that measure the performance of occupant protection systems required by the safety standards that incorporate it. It is designed to be referenced by, and become a part of, the test procedures specified in motor vehicle safety standards such as Standard No. 208, Occupant Crash Protection.

### § 572.4 Terminology.

(a) The term “dummy,” when used in this Subpart A, refers to any test device described by this part. The term “dummy,” when used in any other subpart of this part, refers to the particular dummy described in that part.

(b) Terms describing parts of the dummy, such as “head,” are the same as names for corresponding parts of the human body.

(c) The term “upright position” means the position of the dummy when it is seated in accordance with the procedures of 572.11(i).

### Subpart B—50th Percentile Male

### § 572.5 General description.

(a) The dummy consists of the component assemblies specified in Figure 1, which are described in their entirety by means of approximately 250 drawings and specifications that are grouped by component assembly under the following nine headings:

SA 150 M070	right arm assembly
SA 150 M071	left arm assembly
SA 150 M050	lumbar spine assembly
SA 150 M060	pelvis and abdomen assembly
SA 150 M080	right leg assembly
SA 150 M081	left leg assembly
SA 150 M010	head assembly
SA 150 M020	neck assembly
SA 150 M030	shoulder-thorax assembly

The drawings and specifications are incorporated in this Part by reference to the nine headings, and are available for examination in Docket 73-8, Room 5108, 400 Seventh Street, S.W., Washington, D.C. Copies may be obtained from Keuffel and Esser Company, 1521 North Danville Street, Arlington, Virginia 22201. The drawings and specifications are subject to change, but any amendment will be accomplished by appropriate administrative procedures and noted by publication in the *Federal Register*, and be available for examination and copying as noted in this paragraph.

The drawings and specifications are on file in the reference library of the *Federal Register*, National Archives and Records Service, General Services Administration, Washington, D.C.

(b) Adjacent segments are joined in a manner such that throughout the range of motion and also under crash-impact conditions there is no contact between metallic elements except for contacts that exist under static conditions.

(c) The structural properties of the dummy are such that the dummy conforms to this part in every respect both before and after being used in vehicle tests specified in Standard No. 208 (§ 571.208).

A specimen of the dummy is available for surface measurements, and access can be arranged through: Office of Crashworthiness, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

#### § 572.6 Head.

(a) The head consists of the assembly shown as number SA 150 M010 in Figure 1 and conforms to each of the drawings subtended by number SA 150 M010.

(b) When the head is dropped from a height of 10 inches in accordance with paragraph (c) of this section, the peak resultant accelerations at the location of the accelerometers mounted in the head form in accordance with § 572.11(b) shall be not less than 210g, and not more than 260g. The acceleration/time curve for the test shall be unimodal and shall lie at or above the 100g level for an interval not less than 0.9 milliseconds and not more than 1.5 milliseconds. The lateral acceleration vector shall not exceed 10g.

##### (c) Test procedure:

(1) Suspend the head as shown in Figure 2, so that the lowest point on the forehead is 0.5 inches below the lowest point on the dummy's nose when the midsagittal plane is vertical.

(2) Drop the head from the specified height by a means that ensures instant release onto a rigidly supported flat horizontal steel plate, 2 inches thick and 2 feet square, which has a clean, dry surface and any microfinish of not less than 8 microinches (rms) and not more than 80 microinches (rms).

(3) Allow a time period of at least 2 hours between successive tests on the same head.

#### § 572.7 Neck.

(a) The neck consists of the assembly shown as number SA 150 M020 in Figure 1 and conforms to each of the drawings subtended by number SA 150 M020.

(b) When the neck is tested with the head in accordance with paragraph (c) of this section, the

head shall rotate in reference to the pendulum's longitudinal centerline a total of  $68^\circ \pm 5^\circ$  about its center of gravity, rotating to the extent specified in the following table at each indicated point in time, measured from impact, with a chordal displacement measured at its center of gravity that is within the limits specified. The chordal displacement at time T is defined as the straight line distance between (1) the position relative to the pendulum arm of the head center of gravity at time zero, and (2) the position relative to the pendulum arm of the head center of gravity at time T as illustrated by Figure 3. The peak resultant acceleration recorded at the location of the accelerometers mounted in the head form in accordance with § 572.11(b) shall not exceed 26g. The pendulum shall not reverse direction until  $T = 123$  ms.

Rotation (degrees)	Time (ms) $\pm (2 + .08T)$	Chordal Displacement (inches $\pm 0.5$ )
0	0	0.0
30	30	2.6
60	46	4.8
Maximum	60	5.5
60	75	4.8
30	95	2.6
0	112	0.0

##### (c) Test procedure:

(1) Mount the head and neck on a rigid pendulum as specified in Figure 4, so that the head's midsagittal plane is vertical and coincides with the plane of motion of the pendulum's longitudinal centerline. Mount the neck directly to the pendulum as shown in Figure 4.

(2) Release the pendulum and allow it to fall freely from a height such that the velocity at impact is  $23.5 \pm 2.0$  feet per second (fps), measured at the center of the accelerometer specified in Figure 4.

(3) Decelerate the pendulum to a stop with an acceleration-time pulse described as follows:

(i) Establish 5g and 20g levels on the a-t curve.

(ii) Establish  $t_1$  at the point where the rising a-t curve first crosses the 5g level,  $t_2$  at the point where the rising a-t curve first crosses the 20g level,  $t_3$  at the point where the decaying



a - t curve last crosses the 20g level, and  $t_4$  at the point where the decaying a - t curve first crosses the 5g level.

(iii)  $t_2 - t_1$  shall be not more than 3 milliseconds.

(iv)  $t_3 - t_2$  shall be not less than 25 milliseconds and not more than 30 milliseconds.

(v)  $t_4 - t_3$  shall be not more than 10 milliseconds.

(vi) The average deceleration between  $t_2$  and  $t_3$  shall be not less than 20g and not more than 24g.

(vii) Allow the neck to flex without impact of the head or neck with any object other than the pendulum arm.

### § 572.8 Thorax.

(a) The thorax consists of the assembly shown as number SA 150 M030 in Figure 1, and conforms to each of the drawings subtended by number SA 150 M030.

(b) The thorax contains enough unobstructed interior space behind the rib cage to permit the midpoint of the sternum to be depressed 2 inches without contact between the rib cage and other parts of the dummy or its instrumentation, except for instruments specified in subparagraph (d) (7) of this section.

(c) When impacted by a test probe conforming to § 572.11(a) at 14 fps and at 22 fps in accordance with paragraph (d) of this section, the thorax shall resist with forces measured by the test probe of not more than 1450 pounds and 2250 pounds, respectively, and shall deflect by amounts not greater than 1.1 inches and 1.7 inches, respectively. The internal hysteresis in each impact shall not be less than 50 percent and not more than 70 percent.

#### (d) Test Procedure:

(1) With the dummy seated without back support on a surface as specified in § 572.11(i) and in the orientation specified in § 572.11(i), adjust the dummy arms and legs until they are extended horizontally forward parallel to the midsagittal plane.

(2) Place the longitudinal center line of the test probe so that it is  $17.7 \pm 0.1$  inches above the seating surface at impact.

(3) Align the test probe specified in § 572.11(a) so that at impact its longitudinal centerline

coincides within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(4) Adjust the dummy so that the surface area on the thorax immediately adjacent to the projected longitudinal center line of the test probe is vertical. Limb support, as needed to achieve and maintain this orientation, may be provided by placement of a steel rod of any diameter not less than one-quarter of an inch and not more than three-eighths of an inch, with hemispherical ends, vertically under the limb at its projected geometric center.

(5) Impact the thorax with the test probe so that its longitudinal centerline falls within 2 degrees of a horizontal line in the dummy's midsagittal plane at the moment of impact.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

(7) Measure the horizontal deflection of the sternum relative to the thoracic spine along the line established by the longitudinal centerline of the probe at the moment of impact, using a potentiometer mounted inside the sternum.

(8) Measure hysteresis by determining the ratio of the area between the loading and unloading portions of the force deflection curve to the area under the loading portion of the curve.

### § 572.9 Lumbar spine, abdomen, and pelvis.

(a) The lumbar spine, abdomen, and pelvis consist of the assemblies designated as numbers SA 150 M050 and SA 150 M060 in Figure 1 and conform to the drawings subtended by these numbers.

(b) When subjected to continuously applied force in accordance with paragraph (c) of this section, the lumbar spine assembly shall flex by an amount that permits the rigid thoracic spine to rotate from its initial position in accordance with Figure 11 by the number of degrees shown below at each specified force level, and straighten upon removal of the force to within 12 degrees of its initial position in accordance with Figure 11.

Flexion (degrees)	Force ( $\pm 6$ pounds)
0	0
20	28
30	40
40	52



(c) Test procedure:

(1) Assemble the thorax, lumbar spine, pelvic, and upper leg assemblies (above the femur force transducers), ensuring that all component surfaces are clean, dry, and untreated unless otherwise specified, and attach them to the horizontal fixture shown in Figure 5 at the two link rod pins and with the mounting brackets for the lumbar test fixtures illustrated in Figure 6 to 9.

(2) Attach the rear mounting of the pelvis to the pelvic instrument cavity rear face at the four  $\frac{1}{4}$ " cap screw holes and attach the front mounting at the femur axial rotation joint. Tighten the mountings so that the pelvic-lumbar adapter is horizontal and adjust the femur friction plungers at each hip socket joint to 240 inch-pounds torque.

(3) Flex the thorax forward  $50^\circ$  and then rearward as necessary to return it to its initial position in accordance with Figure 11 unsupported by external means.

(4) Apply a forward force perpendicular to the thorax instrument cavity rear face in the midsagittal plane 15 inches above the top surface of the pelvic-lumbar adapter. Apply the force at any torso deflection rate between .5 and 1.5 degrees per second up to  $40^\circ$  of flexion but no further, continue to apply for 10 seconds that force necessary to maintain  $40^\circ$  of flexion, and record the force with an instrument mounted to the thorax as shown in Figure 5. Release all force as rapidly as possible and measure the return angle 3 minutes after the release.

(d) When the abdomen is subjected to continuously applied force in accordance with paragraph (e) of this section, the abdominal force-deflection curve shall be within the two curves plotted in Figure 10.

(e) Test procedure:

(1) Place the assembled thorax, lumbar spine, and pelvic assemblies in a supine position on a flat, rigid, smooth, dry, clean horizontal surface, ensuring that all component surfaces are clean, dry, and untreated unless otherwise specified.

(2) Place a rigid cylinder 6 inches in diameter and 18 inches long transversely across the abdomen, so that the cylinder is symmetrical about the midsagittal plane, with its longi-

tudinal centerline horizontal and perpendicular to the midsagittal plane at a point 9.2 inches above the bottom line of the buttocks, measured with the dummy positioned in accordance with Figure 11.

(3) Establish the zero deflection point as the point at which a force of 10 pounds has been reached.

(4) Apply a vertical downward force through the cylinder at any rate between 0.25 and 0.35 inches per second.

(5) Guide the cylinder so that it moves without significant lateral or rotational movement.

**§ 572.10 Limbs.**

(a) The limbs consist of the assemblies shown as numbers SA 150 M070, SA 150 M071, SA 150 M080, and SA 150 M081 in Figure 1 and conform to the drawings subtended by these numbers.

(b) When each knee is impacted at 6.9 ft/sec. in accordance with paragraph (c) of this section, the maximum force on the femur shall be not more than 2500 pounds and not less than 1850 pounds, with a duration above 1000 pounds of not less than 1.7 milliseconds.

(c) Test procedure:

(1) Seat the dummy without back support on a surface as specified in § 572.11(i) that is  $17.3 \pm 0.2$  inches above a horizontal surface, oriented as specified in § 572.11(i), and with the hip joint adjustment at any setting between 1g and 2g. Place the dummy legs in planes parallel to its midsagittal plane (knee pivot centerline perpendicular to the midsagittal plane) and with the feet flat on the horizontal surface. Adjust the feet and lower legs until the lines between the midpoints of the knee pivots and the ankle pivots are at any angle not less than 2 degrees and not more than 4 degrees rear of the vertical, measured at the centerline of the knee pivots.

(2) Reposition the dummy if necessary so that the rearmost point of the lower legs at the level one inch below the seating surface remains at any distance not less than 5 inches and not more than 6 inches forward of the forward edge of the seat.

(3) Align the test probe specified in § 572.11(a) so that at impact its longitudinal centerline coincides within  $\pm 2^\circ$  with the longitudinal centerline of the femur.

(4) Impact the knee with the test probe moving horizontally and parallel to the midsagittal plane at the specified velocity.

(5) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

#### **§ 572.11 Test conditions and instrumentation.**

(a) The test probe used for thoracic and knee impact tests is a cylinder 6 inches in diameter that weighs 51.5 pounds including instrumentation. Its impacting end has a flat right face that is rigid and that has an edge radius of 0.5 inches.

(b) Accelerometers are mounted in the head on the horizontal transverse bulkhead shown in the drawings subreferenced under assembly No. SA 150 M010 in Figure 1, so that their sensitive axes intersect at a point in the midsagittal plane 0.5 inches above the horizontal bulkhead and 1.9 inches ventral of the vertical mating surface of the skull with the skull cover. One accelerometer is aligned with its sensitive axis perpendicular to the horizontal bulkhead in the midsagittal plane and with its seismic mass center at any distance up to 0.3 inches superior to the axial intersection point. Another accelerometer is aligned with its sensitive axis parallel to the horizontal bulkhead and perpendicular to the midsagittal plane, and with its seismic mass center at any distance up to 1.3 inches to the left of the axial intersection point (left side of dummy is the same as that of man). A third accelerometer is aligned with its sensitive axis parallel to the horizontal bulkhead in the midsagittal plane, and with its seismic mass center at any distance up to 1.3 inches dorsal to the axial intersection point.

(c) Accelerometers are mounted in the thorax by means of a bracket attached to the rear vertical surface (hereafter "attachment surface") of the thoracic spine so that their sensitive axes intersect at a point in the midsagittal plane 0.8 inches below the upper surface of the plate to which the neck mounting bracket is attached and 3.2 inches perpendicularly forward of the surface to which

the accelerometer bracket is attached. One accelerometer has its sensitive axis oriented parallel to the attachment surface in the midsagittal plane, with its seismic mass center at any distance up to 1.3 inches inferior to the intersection of the sensitive axes specified above. Another accelerometer has its sensitive axis oriented parallel to the attachment surface and perpendicular to the midsagittal plane, with its seismic mass center at any distance up to 0.2 inches to the right of the intersection of the sensitive axes specified above. A third accelerometer has its sensitive axis oriented perpendicular to the attachment surface in the midsagittal plane, with its seismic mass center at any distance up to 1.3 inches dorsal to the intersection of the sensitive axes specified above. Accelerometers are oriented with the dummy in the position specified in § 572.11(i).

(d) A force-sensing device is mounted axially in each femur shaft so that the transverse centerline of the sensing element is 4.25 inches from the knee's center of rotation.

(e) The outputs of acceleration and forcesensing devices installed in the dummy and in the test apparatus specified by this Part are recorded in individual data channels that conform to the requirements of SAE Recommended Practice J211a, December 1971, with channel classes as follows:

- (1) Head acceleration—Class 1000.
- (2) Pendulum acceleration—Class 60.
- (3) Thorax acceleration—Class 180.
- (4) Thorax compression—Class 180.
- (5) Femur force—Class 600.

(f) The mountings for sensing devices have no resonance frequency within a range of 3 times the frequency range of the applicable channel class.

(g) Limb joints are set at 1g, barely restraining the weight of the limb when it is extended horizontally. The force required to move a limb segment does not exceed 2g throughout the range of limb motion.

(h) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.



(i) For the performances tests specified in §§ 572.8, 572.9, and 572.10, the dummy is positioned in accordance with Figure 11 as follows:

(1) The dummy is placed on a flat, rigid, smooth, clean, dry, horizontal, steel test surface whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface and the rearmost points on its lower legs at the level of the test surface are at any distance not less than 5 inches and not more than 6 inches forward of the forward edge of the test surface.

(2) The pelvis is adjusted so that the upper surface of the lumbar-pelvic adapter is horizontal.

(3) The shoulder yokes are adjusted so that they are at the midpoint of their anterior posterior travel with their upper surfaces horizontal.

(4) The dummy is adjusted so that the rear surfaces of the shoulders and buttocks are tangent to a transverse vertical plane.

(5) The upper legs are positioned symmetrically about the midsagittal plane so that the distance between the knee pivot bolt heads is 11.6 inches.

(6) The lower legs are positioned in planes parallel to the midsagittal plane so that the lines between the midpoint of the knee pivots and the ankle pivots are vertical.

(j) The dummy's dimensions, as specified in drawing number SA 150 M002, are determined as follows:

(1) With the dummy seated as specified in paragraph (i), the head is adjusted and secured so that its occiput is 1.7 inches forward of the transverse vertical plane with the vertical mating surface of the skull with its cover parallel to the transverse vertical plane.

(2) The thorax is adjusted and secured so that the rear surface of the chest accelerometer mounting cavity is inclined 3° forward of vertical.

(3) Chest and waist circumference and chest depth measurements are taken with the dummy positioned in accordance with paragraph (i), (1) and (2) of this section.

(4) The chest skin and abdominal sac are removed and all following measurements are made without them.

(5) Seated height is measured from the seating surface to the uppermost point on the head-skin surface.

(6) Shoulder pivot height is measured from the seating surface to the center of the arm elevation pivot.

(7) H-point locations are measured from the seating surface to the center of the holes in the pelvis flesh covering in line with the hip motion ball.

(8) Knee pivot distance from the backline is measured to the center of the knee pivot bolt head.

(9) Knee pivot distance from floor is measured from the center of the knee pivot bolt head to the bottom of the heel when the foot is horizontal and pointing forward.

(10) Shoulder width measurement is taken at arm elevation pivot center height with the centerlines between the elbow pivots and the shoulder pivots vertical.

(11) Hip width measurement is taken at widest point of pelvic section.

(k) Performance tests of the same component, segment, assembly, or fully assembled dummy are separated in time by a period of not less than 30 minutes unless otherwise noted.

(l) Surfaces of dummy components are not painted except as specified in this part or in drawings subtended by this part.

## **Subpart C—Three Year Old Child**

Sec.

572.15 General description.

572.16 Head.

572.17 Neck.

572.18 Thorax.

572.19 Lumbar, spine, abdomen and plevs.

572.20 Limbs.

572.21 Test conditions and instrumentation.

## **Subpart C—Three Year Old Child**

### **§ 572.15 General description.**

(a)(1) The dummy consists of the component assemblies specified in drawing SA 103C 001, which are described in their entirety by means of approximately 122 drawings and specifications grouped by component assemblies under the following headings:



SA 103C 010 Head Assembly  
SA 103C 020 Neck Assembly  
SA 103C 030 Torso Assembly  
SA 103C 041 Upper Arm Assembly Left  
SA 103C 042 Upper Arm Assembly Right  
SA 103C 051 Forearm Hand Assembly Left  
SA 103C 052 Forearm Hand Assembly Right  
SA 103C 061 Upper Leg Assembly Left  
SA 103C 062 Upper Leg Assembly Right  
SA 103C 071 Lower Leg Assembly Left  
SA 103C 072 Lower Leg Assembly Right  
SA 103C 081 Foot Assembly Left  
SA 103C 082 Foot Assembly Right

The drawings and specifications are incorporated in this part by reference to the thirteen headings and are available for examination in Docket 78-09, Room 5108, 400 Seventh Street S.W., Washington, D.C. 20590. Copies may be obtained from Keuffel & Esser Co., 1521 North Danville Street, Arlington, Va. 22201.

(2) The patterns of all cast and molded parts for reproduction of the molds needed in manufacturing of the dummies are incorporated in this part by reference. A set of the patterns can be obtained on a loan basis by manufacturers of the test dummies, or others if need is shown, from the Office of Vehicle Safety Standards, NHTSA, 400 Seventh Street S.W., Washington, D.C. 20590.

(3) An Operation and Maintenance Manual with instructions for the use and maintenance of the test dummies dated May 28, 1976, Contract No. DOT-HS-6-01294 is incorporated in the part by reference. Copies of the manual can be obtained from the Keuffel & Esser Co. All provisions of this manual are valid unless modified by this regulation. This document is available for examination in Docket 78-09.

(4) The drawings, specifications and the manual are subject to changes, but any change will be accomplished by appropriate administrative procedures and announced by publication in the Federal Register and be available for examination and copying as indicated in this paragraph.

(5) The drawings, specifications, patterns, and manual are on file in the reference library of the Federal Register, National Archives and Records Service, General Services Administration, Washington, D.C.

(b) Adjacent segments are joined in a manner such that throughout the range of motion and also under simulated crash-impact conditions, there is no contact between metallic elements except for contacts that exist under static conditions.

(c) The structural properties of the dummy are such that the dummy conforms to this part in every respect both before and after being used in tests specified by Standard No. 213, Child Restraint Systems (§ 571.213).

#### **§ 572.16 Head.**

(a) The head consists of the assembly shown in drawing SA 103C 001 by number SA 103C 010, and conforms to each of the drawings listed under this number on drawing SA 103C 002, sheet 8.

(b) When the head is impacted in accordance with paragraph (c) of this section by a test probe conforming to § 572.21(a) at 7 fps., the peak resultant accelerations measured at the location of the accelerometers mounted in the headform in accordance with § 572.21(b) shall be not less than 95g, and not more than 115g. The recorded acceleration-time curve for this test shall be unimodal at, or above the 50g level and shall lie at, or above that level for an interval not less than 2.0 and not more than 3.0 milliseconds. The lateral acceleration vector shall not exceed 7g.

#### *(c) Test Procedure:*

(1) Seat the dummy on a seating surface having a back support as specified in § 572.21(h) and orient the dummy in accordance with § 572.21(h) and adjust the joints of the limbs at any setting between 1g and 2g, which just supports the limbs' weight when the limbs are extended horizontally forward.

(2) Adjust the test probe so that its longitudinal centerline is at the forehead at the point of orthogonal intersection of the head midsagittal plane and the transverse plane which is perpendicular to the "Z" axis of the head (longitudinal centerline of the skull anchor) and is located  $0.6 \pm .1$  inches above the centers of the head center of gravity reference pins and coincides within 2 degrees with the line made by the intersection of horizontal and midsagittal planes passing through this point.

(3) Adjust the dummy so that the surface area on the forehead immediately adjacent to the projected longitudinal centerline of the test probe is vertical.

(4) Impact the head with the test probe so that at the moment of impact the probe's longitudinal centerline falls within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(5) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

(6) Allow a time period of at least 20 minutes between successive tests of the head.

#### § 572.17 Neck.

(a) The neck consists of the assembly shown in drawing SA 103C 001 as number SA 103C 020, and conforms to each of the drawings listed under this number on drawing SA 103C 002, sheet 9.

(b) When the head-neck assembly is tested in accordance with paragraph (c) of this section, the head shall rotate in reference to the pendulum's longitudinal centerline a total of 84 degrees  $\pm$  8 degrees about its center of gravity, rotating to the extent specified in the following table at each indicated point in time, measured from impact, with the chordal displacement measured at its center of gravity. The chordal displacement at time T is defined as the straight line distance between (1) the position relative to the pendulum arm of the head center of gravity at time zero, and (2) the position relative to the pendulum arm of the head center of gravity at time T as illustrated by Figure 3. The peak resultant acceleration recorded at the location of the accelerometers mounted in the headform in accordance with § 572.21(b) shall not exceed 30g. The pendulum shall not reverse direction until the head's center of gravity returns to the original zero time position relative to the pendulum arm.

Rotation (degrees)	Time (ms) $\pm$ (2 + .08T)	Chordal Displacement (inches $\pm$ 0.8)
0.....	0	0
30.....	21	2.2
60.....	36	4.3
Maximum .....	62	5.8
60.....	91	4.3
30.....	108	2.2
0.....	123	0

#### (c) Test Procedure:

(1) Mount the head and neck on a rigid pendulum as specified in Figure 4, so that the head's

midsagittal plane is vertical and coincides with the plane of motion of the pendulum's longitudinal centerline. Mount the neck directly to the pendulum as shown in Figure 15.

(2) Release the pendulum and allow it to fall freely from a height such that the velocity at impact is  $17.00 \pm 1.0$  feet per second (fps), measured at the center of the accelerometer specified in Figure 4.

(3) Decelerate the pendulum to a stop with an acceleration-time pulse described as follows:

(i) Establish 5g and 20g levels on the a-t curve.

(ii) Establish  $t_1$  at the point where the a-t curve first crosses the 5g level,  $t_2$  at the point where the rising a-t curve first crosses the 20g level,  $t_3$  at the point where the decaying a-t curve last crosses the 20g level, and  $t_4$  at the point where the decaying a-t curve first crosses the 5g level.

(iii)  $t_2 - t_1$ , shall be not more than 4 milliseconds.

(iv)  $t_3 - t_2$ , shall be not less than 18 and not more than 21 milliseconds.

(v)  $t_4 - t_3$ , shall be not more than 5 milliseconds.

(vi) The average deceleration between  $t_2$  and  $t_3$  shall be not less than 20g and not more than 34g.

(4) Allow the neck to flex without contact of the head or neck with any object other than the pendulum arm.

(5) Allow a time period of at least 1 hour between successive tests of the head and neck.

#### § 572.18 Thorax.

(a) The thorax consists of the part of the torso shown in assembly drawing SA 103C 001 by number SA 103C 030 and conforms to each of the applicable drawings listed under this number on drawings SA 103C 002, sheets 10 and 11.

(b) When impacted by a test probe conforming to § 572.21(a) at 13 fps. in accordance with paragraph (c) of this section, the peak resultant accelerations at the location of the accelerometers mounted in the chest cavity in accordance with § 572.21(c) shall be not less than 50g and not more than 70g. The acceleration-time curve for the test shall be unimodal at or above the 30g level and shall lie at or above the 30g level for an interval not less than 2.5 milliseconds and not more than 4.0 milliseconds. The lateral acceleration shall not exceed 5g.

#### (c) Test Procedure:

(1) With the dummy seated without back support on a surface as specified in § 572.21(h) and



oriented as specified in § 572.21(h), adjust the dummy arms and legs until they are extended horizontally forward parallel to the midsagittal plane, the joints of the limbs are adjusted at any setting between 1g and 2g, which just supports the limbs' weight when the limbs are extended horizontally forward.

(2) Establish the impact point at the chest midsagittal plane so that it is 1.5 inches below the longitudinal centerline of the bolt that attaches the top of the ribcage sternum to the thoracic spine box.

(3) Adjust the dummy so that the tangent plane at the surface on the thorax immediately adjacent to the designated impact point is vertical and parallel to the face of the test probe.

(4) Place the longitudinal centerline of the test probe to coincide with the designated impact point and align the test probe so that at impact its longitudinal centerline coincides within 2 degrees with the line formed by intersection of the horizontal and midsagittal planes passing through the designated impact point.

(5) Impact the thorax with the test probe so that at the moment of impact the probe's longitudinal centerline falls within 2 degrees of a horizontal line in the dummy midsagittal plane.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical or rotational movement.

(7) Allow a time period of at least 20 minutes between successive tests of the chest.

#### **§ 572.19 Lumbar spine, abdomen and pelvis.**

(a) The lumbar spine, abdomen, and pelvis consist of the part of the torso assembly shown by number SA 103C 030 on drawing SA 103C 001 and conform to each of the applicable drawings listed under this number on drawing SA 103C 002, sheets 10 and 11.

(b) When subjected to continuously applied force in accordance with paragraph (c) of this section, the lumbar spine assembly shall flex by an amount that permits the rigid thoracic spine to rotate from its initial position in accordance with Figure 18 of this subpart by 40 degrees at a force level of not less than 34 pounds and not more than 47 pounds, and straighten upon removal of the force to within 5 degrees of its initial position.

(c) *Test Procedure:* (1) The dummy with lower legs removed is positioned in an upright seated position on a seat as indicated in Figure 18, ensuring that all dummy component surfaces are clean, dry and untreated unless otherwise specified.

(2) Attach the pelvis to the seating surface by a bolt C/328, modified as shown in Figure 18, and the upper legs at the knee axial rotation joints by the attachments shown in Figure 18. Tighten the mountings so that the pelvis-lumbar joining surface is horizontal and adjust the femur ball-flange screws at each hip socket joint to 50 inch pounds torque. Remove the head and the neck and install a cylindrical aluminum adapter 2.0 inches in diameter and 2.80 inches long in place of the neck.

(3) Flex the thorax forward 50 degrees and then rearward as necessary to return to its initial position in accordance with Figure 18 unsupported by external means.

(4) Apply a forward pull force in the midsagittal plane at the top of the neck adapter, so that at 40 degrees of the lumbar spine flexion the applied force is perpendicular to the thoracic spine box. Apply the force at any torso deflection rate between 0.5 and 1.5 degrees per second up to 40 degrees of flexion but no further; continue to apply for 10 seconds the force necessary to maintain 40 degrees of flexion, and record the highest applied force at that time. Release all force as rapidly as possible and measure the return angle 3 minutes after the release.

#### **§ 572.20 Limbs.**

The limbs consist of the assemblies shown on drawing SA 103C 001 as Nos. SA 103C 041, SA 103C 042, SA 103C 051, SA 103C 052, SA 103C 061, SA 103C 062, SA 103C 071, SA 103C 072, SA 103C 081, SA 103C 082, and conform to each of the applicable drawings listed under their respective numbers of the drawing SA 103C 002, sheets 12 through 21.

#### **§ 572.21 Test conditions and instrumentation.**

(a) The test probe used for head and thoracic impact tests is a cylinder 3 inches in diameter, 13.8 inches long and weighs 10 lbs., 6 ozs. Its impacting end has a flat right face that is rigid and that has an edge radius of 0.5 inches.

(b) Accelerometers are mounted in the head on the mounting block (A/310) located on the horizontal transverse bulkhead shown in the drawings



subreferenced under assembly SA 103C 010 so that their sensitive axes are orthogonal and their seismic masses are positioned relative to the axial intersection point. Except in the case of tri-axial accelerometers, the sensitive axes shall intersect at the axial intersection point located at the intersection of a line connecting the longitudinal centerlines of the transfer pins in the sides of the dummy head with the midsagittal plane of the dummy head. One accelerometer is aligned with its sensitive axis parallel to the vertical bulkhead and midsagittal plane, and with its seismic mass center at the midsagittal plane at any distance up to 0.3 inches dorsal and 0.1 inches inferior to the axial intersection point. Another accelerometer is aligned with its sensitive axis in the horizontal plane and perpendicular to the midsagittal plane, and with its seismic mass center at any distance up to 0.2 inches inferior to, 0.4 inches to the right of, and 1 inch dorsal to the axial intersection point (right side of dummy is the same as that of child). A third accelerometer is aligned with its sensitive axis parallel to the midsagittal and horizontal planes, and with its seismic mass center at any distance up to 0.2 inches inferior to, 0.6 inches dorsal to, and 0.4 inches to the right of the axial intersection point. In the case of a tri-axial accelerometer, its axes are aligned in the same way that the axes of three separate accelerometers are aligned.

(c) Accelerometers are mounted in the thorax on the mounting plate attached to the vertical transverse bulkhead shown in the drawings subreferenced under assembly No. SA 103C 030 in drawing SA 103C 001 so that their sensitive axes are orthogonal and their seismic masses are positioned relative to the axial intersection point located in the midsagittal plane 3 inches above the top surface of the lumbar spine and 0.3 inches dorsal to the accelerometer mounting plate surface. Except in the case of tri-axial accelerometers, the sensitive axes shall intersect at the axial intersection point. One accelerometer is aligned with its sensitive axis parallel to the vertical bulkhead and midsagittal planes, and with its seismic mass center at any distance up to 0.2 inches to the right, 0.2 inches inferior and 0.1 inches ventral of the axial intersection point. Another accelerometer is aligned with its sensitive axis in the horizontal transverse plane and perpendicular to the midsagittal plane and with its seismic mass center at any distance up to 0.3 inches to the left, 0.2 inches

inferior and 0.2 inches ventral to the axial intersection point. A third accelerometer is aligned with its sensitive axis parallel to the midsagittal and horizontal planes and with its seismic mass center at any distance up to 0.3 inches superior, 0.6 inches to the right and 0.1 inches ventral to the axial intersection point. In the case of a tri-axial accelerometer, its axes are aligned in the same way that the axes of three separate accelerometers are aligned.

(d) The outputs of accelerometers installed in the dummy, and of test apparatus specified by this part, are recorded in individual data channels that conform to the requirements of SAE Recommended Practice J211a, December 1971, with channel classes as follows:

- (1) Head acceleration—Class 1,000.
- (2) Pendulum acceleration—Class 60.
- (3) Thorax acceleration—Class 180.

(e) The mountings for accelerometers have no resonance frequency less than 3 times the cut-off frequency of the applicable channel class.

(f) Limb joints are set at the force between 1-2g, which just supports the limbs' weight when the limbs are extended horizontally forward. The force required to move a limb segment does not exceed 2g throughout the range of limb motion.

(g) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.

(h) For the performance tests specified §§ 572.16, 572.18, and 572.19, the dummy is positioned in accordance with Figures 16, 17, and 18 as follows:

(1) The dummy is placed on a flat, rigid, clean, dry, horizontal surface of teflon sheeting with a smoothness of 40 microinches and whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface. For head tests, the seat has a vertical back support whose top is  $12.4 \pm 0.2$  inches above the seating surface. The rear surfaces of the dummy's shoulders and buttocks are touching the back support as shown in Figure 16. For thorax and lumbar spine tests, the seating surface is without the back support as shown in Figures 17 and 18 respectively.

(2) The shoulder yokes are adjusted so that they are at the midpoint of their anterior-posterior travel with their upper surfaces horizontal.

(3) The dummy is adjusted for head impact and lumbar flexion tests so that the rear surfaces of the shoulders and buttocks are tangent to a transverse vertical plane.

(4) The arms and legs are positioned so that their centerlines are in planes parallel to the mid-sagittal plane.

(i) The dummy's dimensions are specified in drawings No. SA 103C 002, sheets 22 through 26.

(j) Performance tests of the same component, segment, assembly or fully assembled dummy are separated in time by a period of not less than 20 minutes unless otherwise specified.

(k) Surfaces of the dummy components are not painted except as specified in this part or in drawings subtended by this part.

3. A new Subpart D—Six Month Old Infant is added to Part 572 (49 CFR 572) to read as follows:

#### **Subpart D—Six Month Old Infant**

Sec.

572.25 General description.

#### **Subpart D—Six Month Old Infant**

##### **§ 572.25 General Description.**

(a) The infant dummy is specified in its entirety by means of 5 drawings (No. SA 100I 001) and a construction manual which describes in detail the materials and the procedures involved in the manufacturing of this dummy. The drawings and the manual are incorporated in this part by reference and are available for examination in Docket 78-09, Room 5108, 400 Seventh Street S.W., Washington, D.C. Copies may be obtained from Keuffel & Esser Co., 1512 North Danville Street, Arlington, Va. 22201. The drawings and the manual are subject to changes, but any change will be accomplished by appropriate administrative procedures and announced by publication in the Federal Register and be available for examination and copying as indicated in this paragraph. The drawings and manual are on file in the reference library of the Federal Register, National Archives and Records Services, General Services Administration, Washington, D.C.

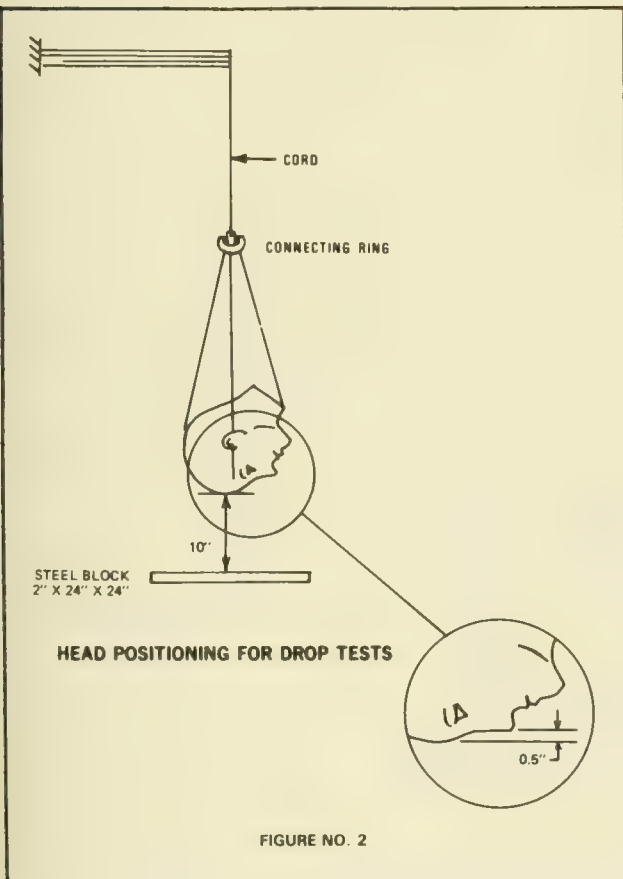
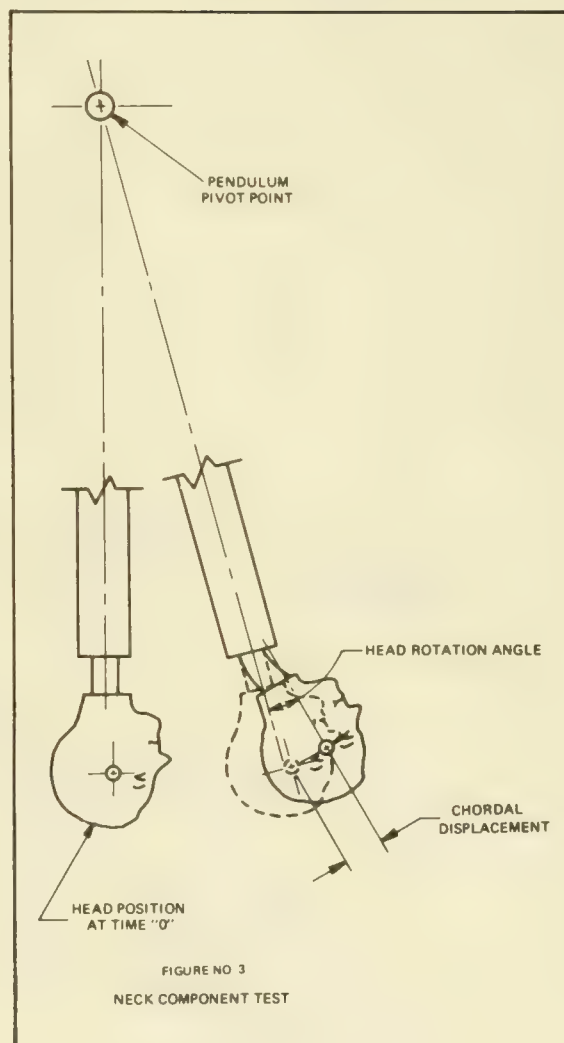
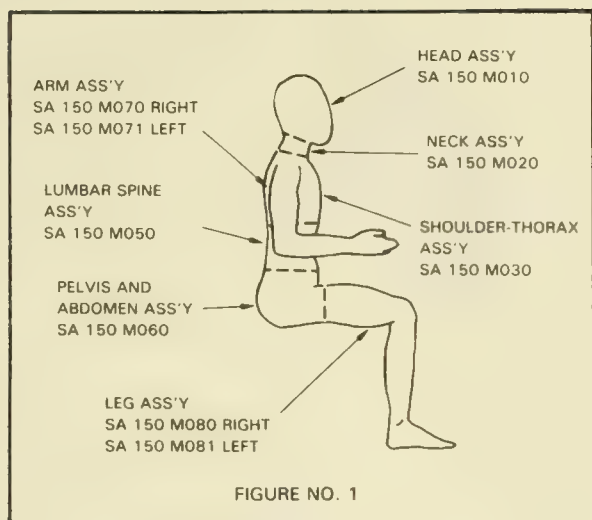
(b) The structural properties and dimensions of the dummy are such that the dummy conforms to this part in every respect, both before and after being used in tests specified by Standard No. 213 (571.213).

38 F.R. 20449

August 1, 1973







INERTIAL PROPERTIES OF PENDULUM  
WITHOUT TEST SPECIMEN.

WEIGHT 65.2 LBS.

MOMENT OF INERTIA  $24.5 \text{ LB-FT SEC}^2$   
ABOUT PIVOT AXIS

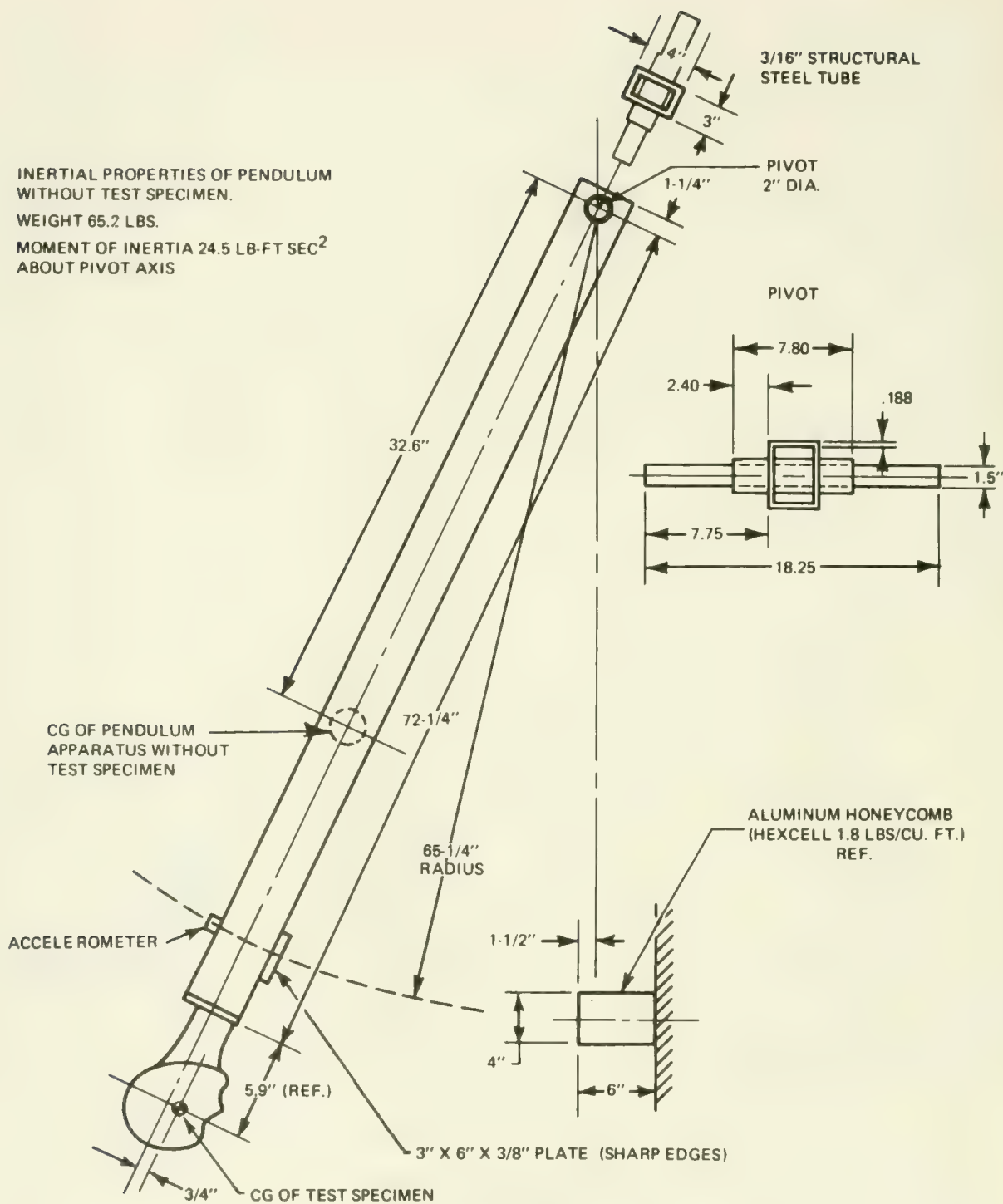
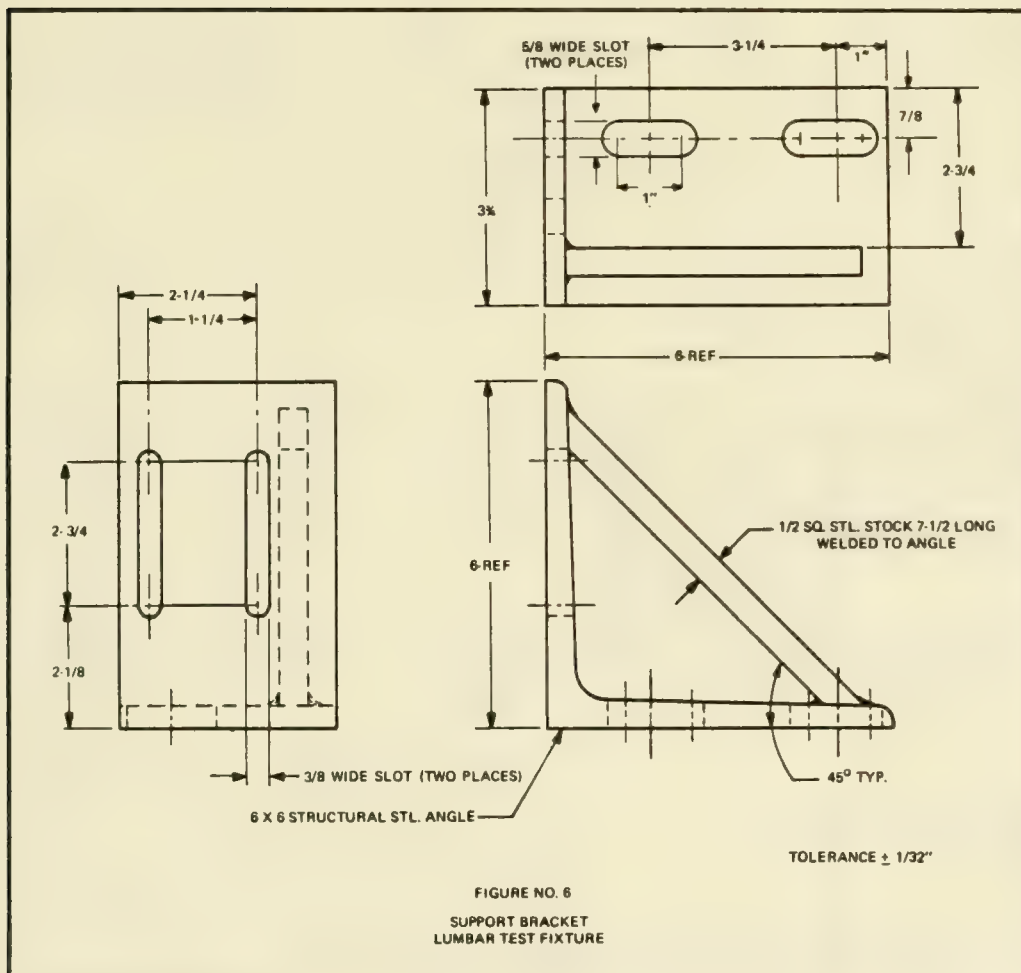
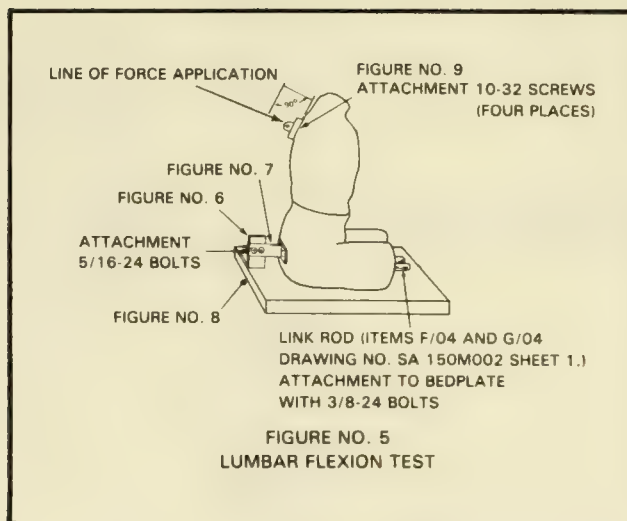
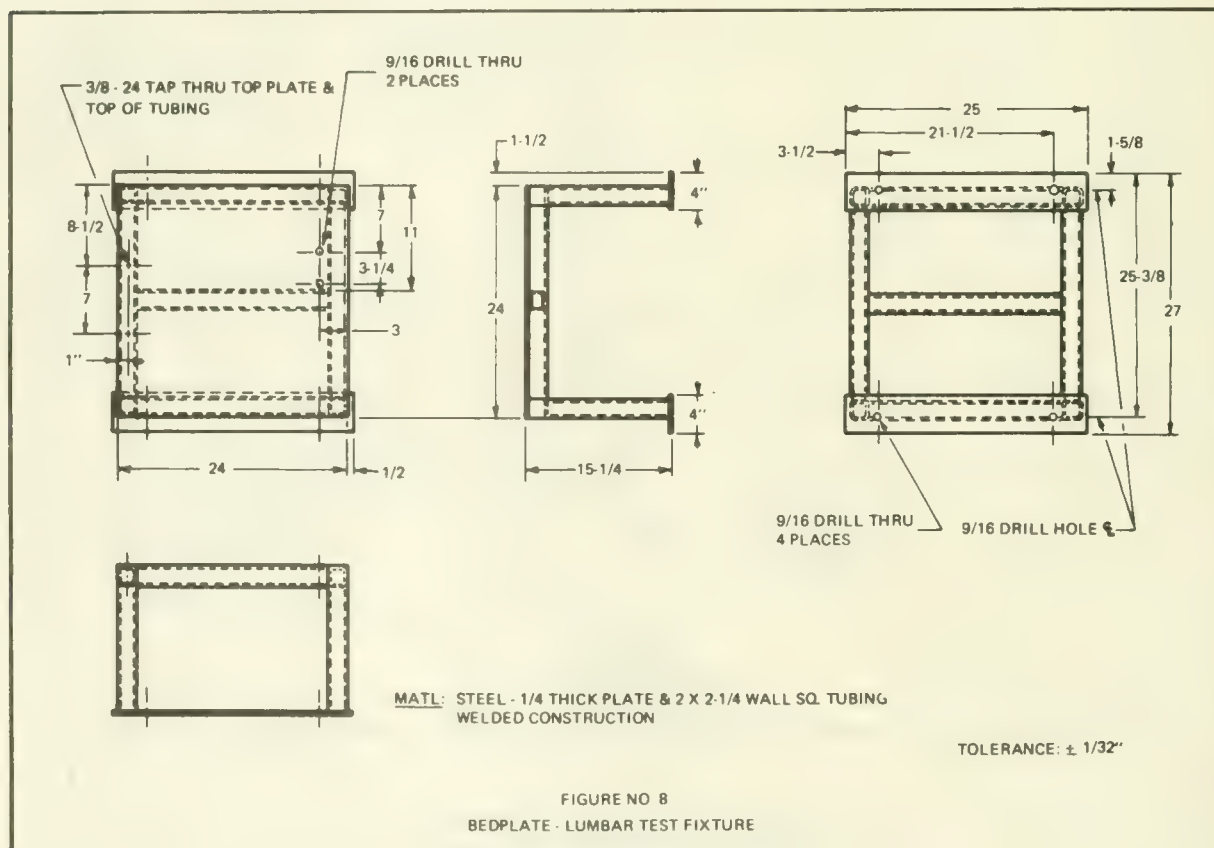
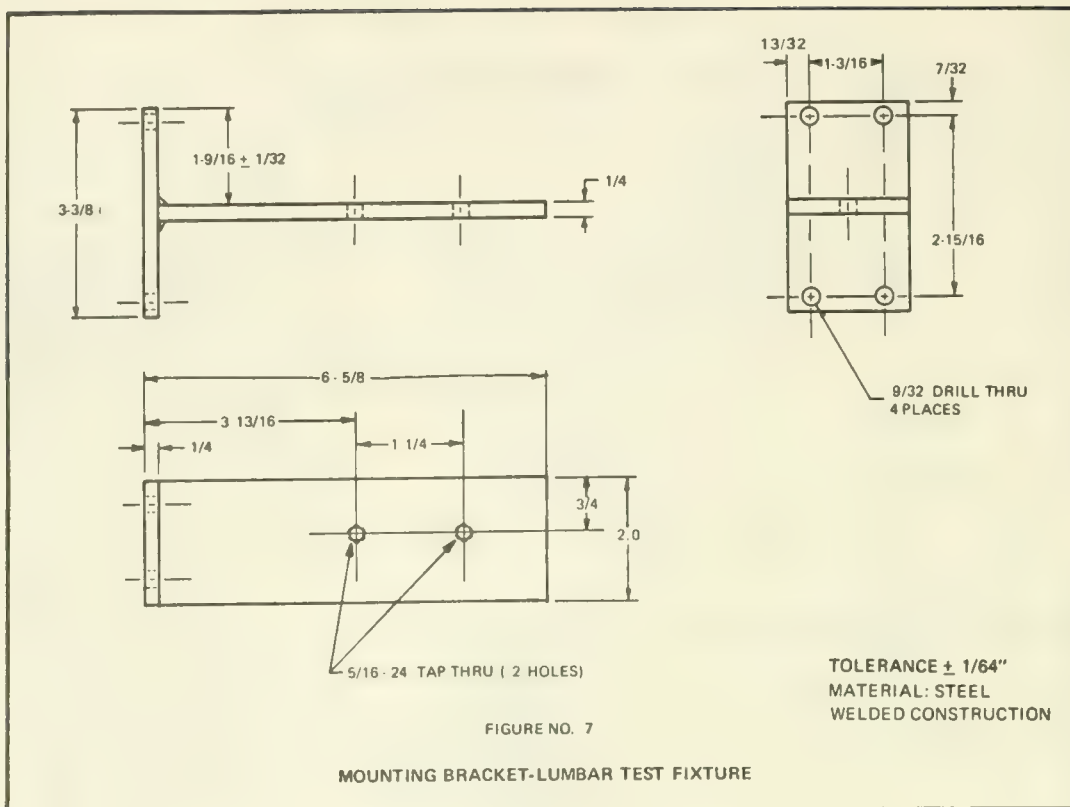


FIGURE NO. 4  
NECK COMPONENT TEST







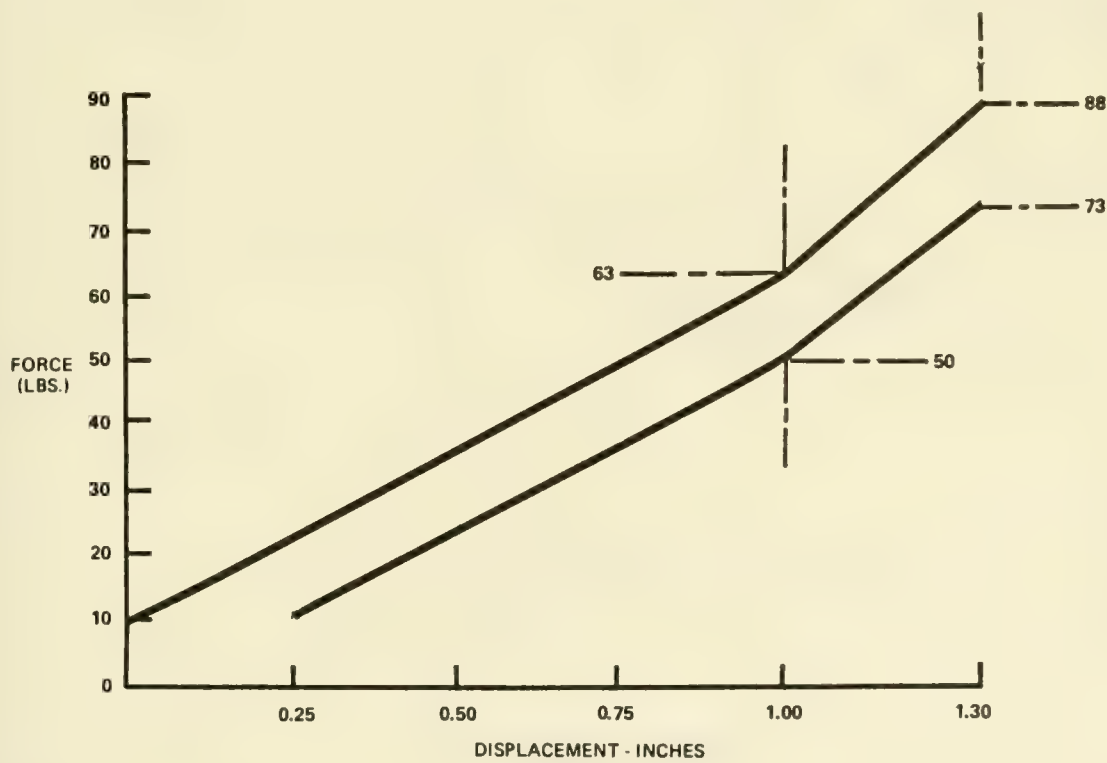
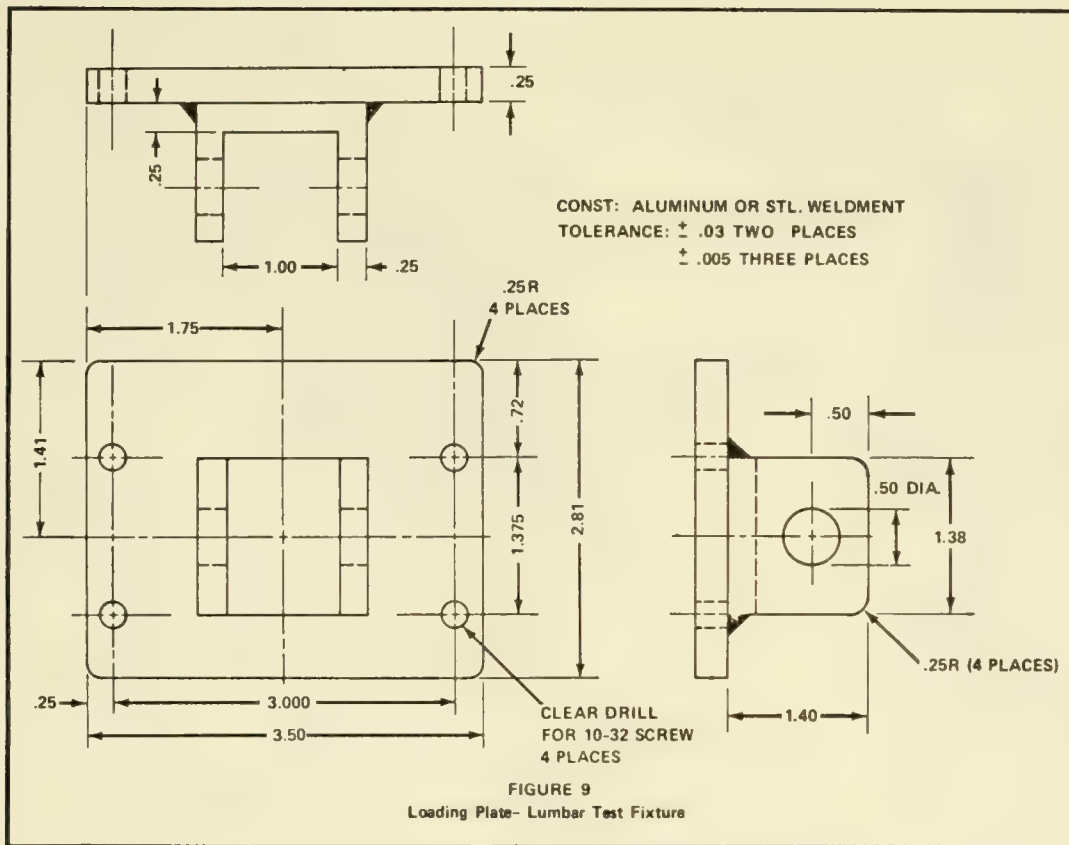


FIGURE NO. 10  
 ABDOMEN COMPONENT TEST

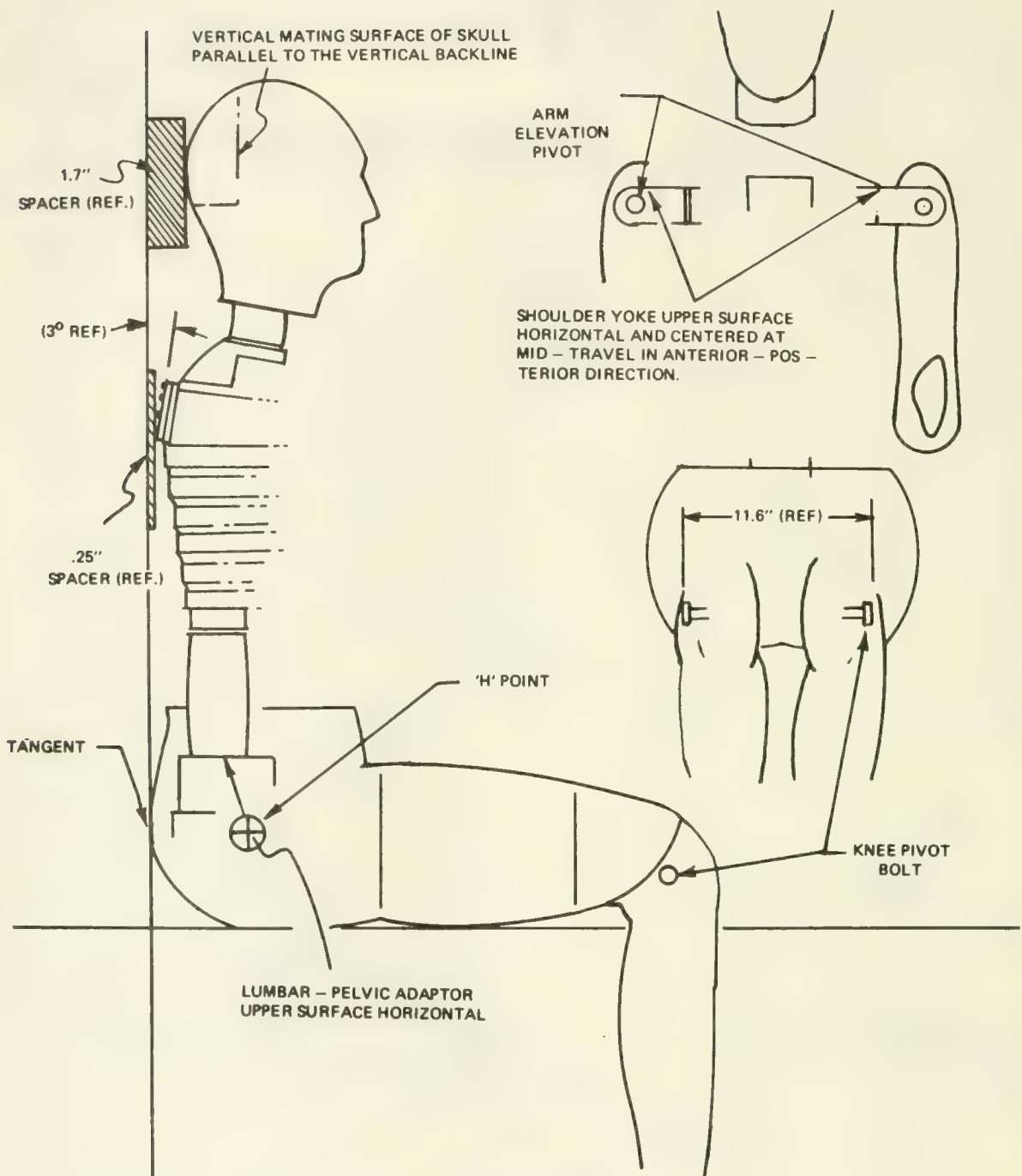


FIGURE No. 11

**UPRIGHT SEATED POSITION FOR LINEAR MEASUREMENTS**



**Space for figures 12 thru 14  
reserved for future use.**

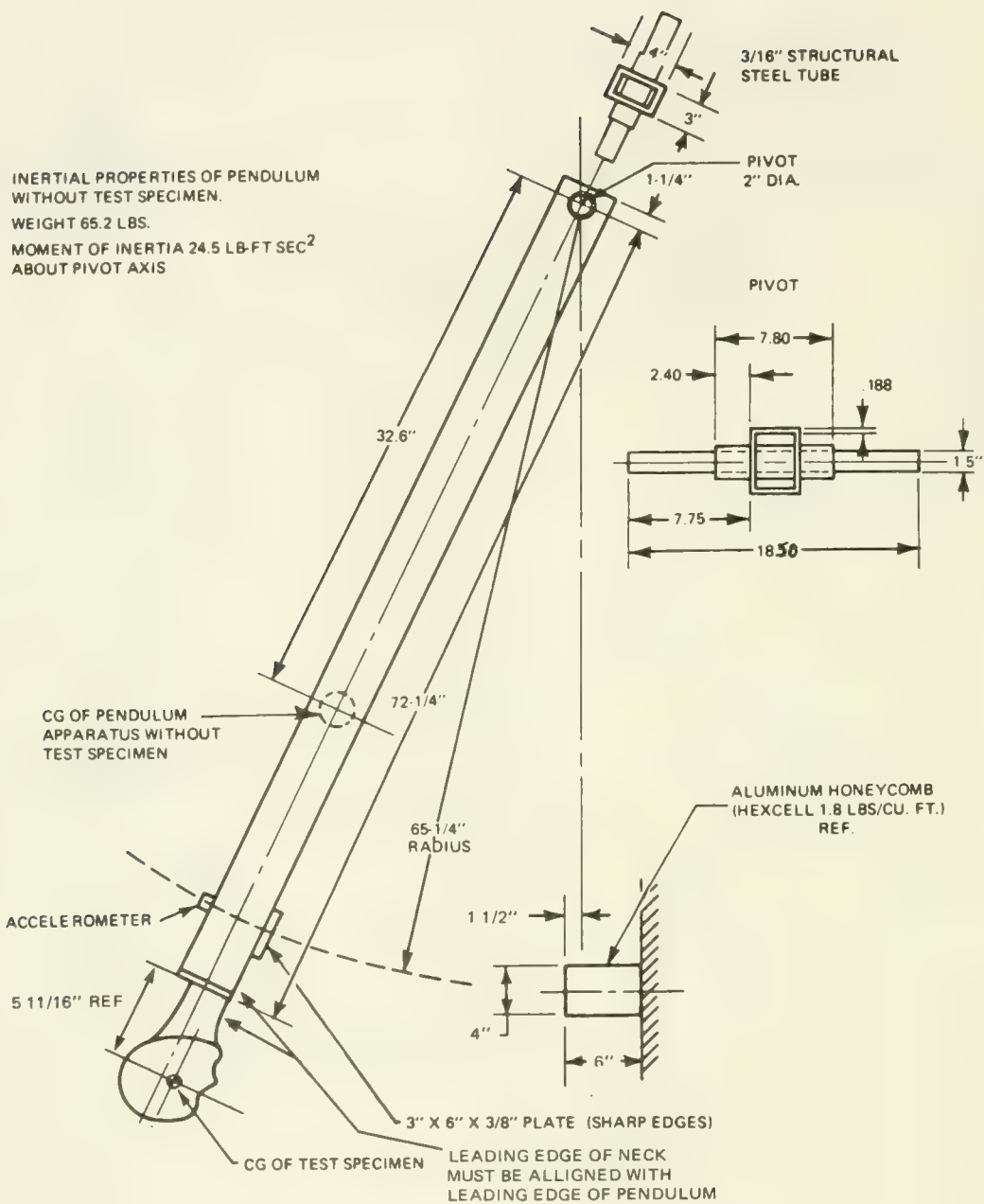


FIGURE NO. 15  
NECK COMPONENT TEST

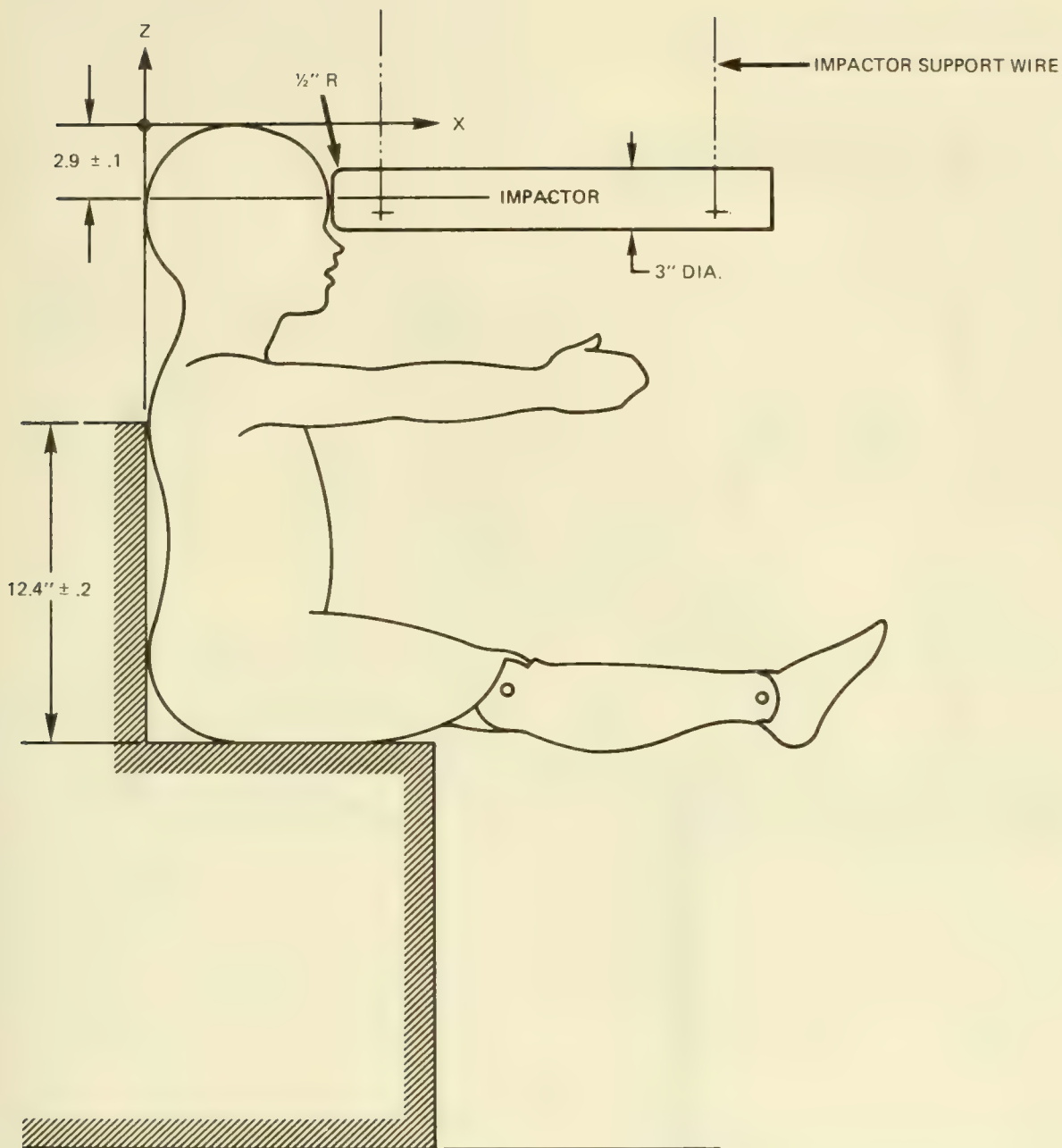


FIGURE NO. 16  
HEAD IMPACT TEST



IMPACTOR FACE TO BE VERTICAL  $\pm 2^\circ$   
AT CONTACT OF CHEST

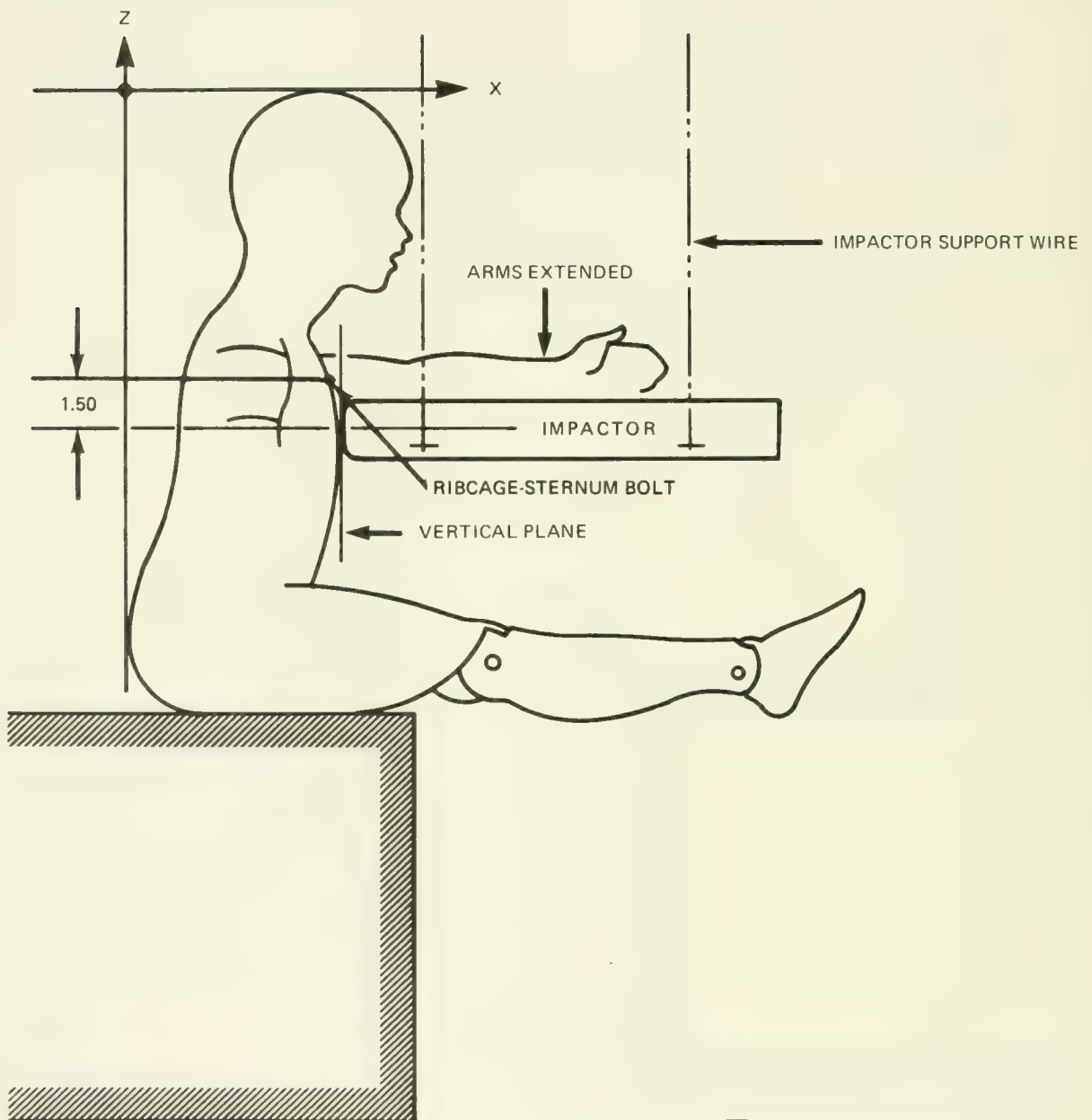


FIGURE NO. 17  
CHEST IMPACT TEST

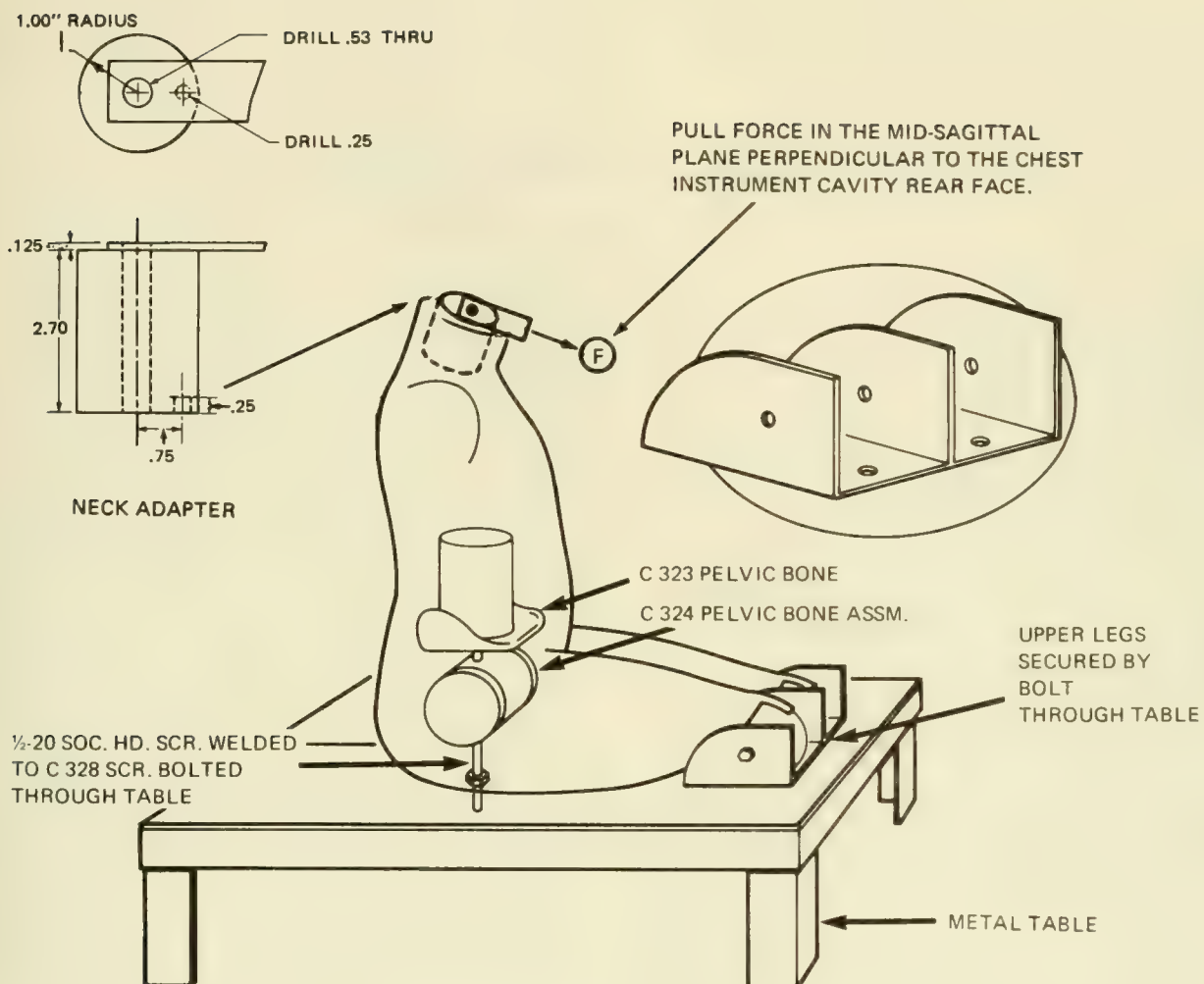


FIGURE NO. 18  
LUMBAR-SPINE FLEXION TEST





## PREAMBLE TO PART 573—DEFECT REPORTS

(Docket No. 69-31; Notice No. 2)

On December 24, 1969, a notice of proposed rulemaking entitled, "Defect Reports", was published in the *Federal Register* (34 F.R. 20212). The notice proposed requirements for reports and information regarding defects in motor vehicles, to be submitted to the National Highway Traffic Safety Administration by manufacturers of motor vehicles pursuant to sections 112, 113, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1401, 1402, and 1407).

The notice requested comments on the proposed requirements. All comments received have been considered and some are discussed below.

Several comments asked whether both the fabricating manufacturer and the importer of imported vehicles were required to comply with all the proposed requirements. A similar question was asked in regard to manufacturers of incomplete vehicles and subsequent manufacturers of the same vehicles. In response to the comments, § 573.3 provides that in the case of imported vehicles, compliance by either the fabricating manufacturer or the importer of the imported vehicle with §§ 573.4 and 573.5 of this part, with respect to a particular defect, shall be considered compliance by both. In the case of vehicles manufactured in two or more stages, compliance by either the manufacturer of the incomplete vehicle or one of the subsequent manufacturers of the vehicle with §§ 573.4 and 573.5 of this part, with respect to a particular defect, shall be considered compliance by both the incomplete vehicle manufacturer and the subsequent manufacturers.

Many comments requested that the time for the initial filing of the direct information report be increased to allow opportunity for the extensive and complex testing often necessary to determine whether a defect is safety-related. As

proposed, the time for initially filing the report was within 5 days after the discovery of a defect that the manufacturer subsequently determined to be safety-related. In response to these comments, § 573.4(b) provides that the report shall be submitted by the manufacturer not more than 5 days after he or the Administrator has determined that a defect in the manufacturer's vehicles relates to motor vehicle safety.

Several comments requested the deletion of one or more items of information proposed for inclusion in the defect information report. Objections to providing an evaluation of the risk of accident due to the defect, a list of all incidents related to the defect, and an analysis of the cause of the defect were based on the ground that the information would be inherently speculative. The proposed requirements for these three items of information have been deleted. In place of the list of incidents, § 573.4(c)(6) requires a chronology of all principal events that were the basis for the determination of the existence of a safety-related defect. In accordance with the deletion of the list of incidents, the provision in the proposal requiring quarterly reports to contain information concerning previously unreported incidents has also been deleted.

Several comments stated that the requirement in the proposal for the submission of a copy of all communications sent to dealers and purchasers concerning a safety-related defect would create an unreasonable burden on the manufacturers. The comments reported that the manufacturers would be required to submit to the Administration a large volume of useless correspondence between the manufacturers and individual dealers or purchasers. To mitigate this problem, § 573.4(c)(8) provides that the manufacturers shall submit to the Administration only those communications that are sent to more

than one dealer or purchaser. For the same reason, the requirement in § 573.7 that a manufacturer submit a copy of all communications, other than those required under § 573.4(c)(8), regarding any defect, whether or not safety-related, in his vehicles, is also limited to communications sent to more than one person.

Many comments requested that a regular schedule for submitting quarterly reports be established. They suggested that this be accomplished by requiring that the first quarter for submitting a quarterly report with respect to a particular defect be the calendar quarter in which the defect information report for the defect is initially submitted. As proposed, the first quarter began on the date on which the defect information report was initially submitted. Several of these comments also objected to the proposed requirements for submitting both quarterly reports and annual defect summaries on the ground that the latter would be partially redundant. In response to these comments, the proposed requirement for filing a separate series of quarterly reports for each defect notification campaign has been deleted. Instead, § 573.5(a) requires that each manufacturer submit a quarterly report not more than 25 working days after the close of each calendar quarter. The information specified in § 573.5(c) is required to be provided with respect to each notification campaign, beginning with the quarter in which the campaign was initiated. Unless otherwise directed by the Administration, the information for each campaign is to be included in the quarterly reports for six consecutive quarters or until corrective action has been completed on all

defective vehicles involved in the campaign, whichever occurs sooner.

The proposed requirement for filing annual summaries has been deleted. Instead, § 573.5(d) requires that the figures provided in the quarterly reports under paragraph (c)(5), (6), (7), and (8) of § 573.5 be cumulative. In addition, § 573.5(b) requires that each quarterly report contain the total number of vehicles produced during the quarter for which the report is submitted.

Several changes have been made for the purpose of clarification, § 573.4(c)(8) requires that manufacturers submit three copies of the communications specified in that section. In response to questions concerning the use of computers for maintaining owner lists, a reference to computer information storage devices and card files has been added to § 573.6 to indicate that they are suitable. A reference to first purchasers and subsequent purchasers to whom a warranty has been transferred, and any other owners known to the manufacturer, has been added to the same section to make clear that the owner list is required to include both types of purchasers as well as other known owners.

Effective date: October 1, 1971.

Issued on February 10, 1971.

Douglas W. Toms,  
Acting Administrator, National Highway Traffic Safety Administration.

36 F.R. 3064  
February 17, 1971



## PREAMBLE TO AMENDMENT TO PART 573—DEFECT REPORTS

(Docket No. 69-31; Notice 5)

This notice amends the Defect Reports regulation (49 CFR Part 573) to require manufacturers to submit vehicle identification numbers as part of the information furnished by them to the NHTSA. A notice of proposed rulemaking regarding this subject was published November 7, 1972 (37 F.R. 23650).

The purpose of including VIN's in defect reports would be to improve the notification of owners of vehicles involved in safety defect notification campaigns. The State Farm Insurance Company had suggested, for example, that insurance companies could use VIN's to identify vehicles which they insure, and to themselves notify owners of record. The Center for Auto Safety also requested the inclusion of VIN's in defect reports, so it could more readily inform persons who inquire whether particular vehicles were subject to campaigns. Other possible uses, it was noted, would be that State and local inspection facilities could determine, as part of inspection programs, whether particular vehicles had been subjected to campaigns, and if so, whether they had been repaired.

The proposal would have required the submission in the "defect information report" (§ 573.4), within five days of the defect determination, of the vehicle identification number for each vehicle potentially affected by the defect. It also proposed to substitute "line" for "model" as one of the identifying classifications describing potentially affected vehicles.

The comments demonstrated that the vehicle identification number is a useful tool for locating second and later owners of vehicles. In a study conducted by the Ford Motor Company and the State Farm Insurance Company, a fairly significant percentage of owners who either had not received or responded to the initial notification

mailed by the manufacturer did respond to subsequent letters sent on the basis of the VIN.

As a result of comments received, however, the NHTSA has decided that vehicle identification numbers should only be required to be supplied in the second "quarterly report", approximately six months after a campaign is initiated, rather than in the defect information report as proposed. Only the VIN's for vehicles not repaired by that date are required to be provided. The NHTSA believes this approach will provide the safety benefits to be derived from having publicly available lists of defective vehicle VIN's and will also reduce duplication and facilitate the agency's efforts to compile and report the information.

The NHTSA requests that vehicle identification numbers be submitted in a form suitable for automatic data processing (magnetic tape, discs, punched cards, etc.) when more than 500 numbers are reported for any single campaign. While not required by this notice, the use of automatic data processing for large campaigns will facilitate the dissemination of the information for the agency. The agency may include specific requirements in this regard at a later time.

The comments argued that the benefits of having VIN's available during the initial stages of a campaign are limited, and that the compilation of identification numbers for every vehicle in a campaign would create significant problems for manufacturers related to conducting campaigns. The NHTSA believes these comments to have merit. It is clear that the chief use of VIN's will be to notify other than first purchasers, *i.e.*, owners of older vehicles, as the names of these owners will not be available to manufacturers. By delaying the furnishing of VIN's until the filing of the second quarterly report, the VIN's reported will represent to a greater



Effective: May 6, 1974

degree the names and addresses of second and later owners. The later reporting will also reduce the possibility that first purchasers will receive duplicate notices.

Many comments challenged generally the utility of the VIN in notification campaigns. Other comments complained that insurance companies might abuse the information; for example, by cancelling policies on defective vehicles. Still others believed VIN's to be privileged proprietary information, both taken separately and when combined with other information submitted pursuant to Part 573.

While it is true that the effectiveness of the requirement will depend to an extent upon the voluntary activities of third parties, the NHTSA does not view this as a reason not to issue the requirement. The offers of insurance companies and other groups to participate in notification campaigns appear to be reasonable and properly motivated. There has been no evidence brought to the NHTSA's attention to support the allegations of possible misuse of the information by insurance companies.

The agency also cannot agree that information identifying defective vehicles is or relates to proprietary information. The comments on this point seem to equate what may be embarrassing information with notions of confidentiality.

There is no basis under existing statutory definitions of confidentiality for including within them VIN's or other information identifying defective vehicles.

The proposed substitution of "line" for "model" in the descriptive information for vehicles was opposed in one comment because the term "line" is apparently more suited for passenger cars than other vehicle types. The comment indicated that "model" is a more appropriate term for trucks. In light of this comment, the terms are specified as alternatives in the regulation.

In light of the above, Part 573 of Title 49, Code of Federal Regulations, "Defect Reports," is amended. . . .

*Effective date:* May 6, 1974.

(Sections 103, 112, 113, and 119, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1402, 1407, and the delegation of authority at 49 CFR 1.51 Office of Management and Budget Approved 04-R5628.)

Issued on January 30, 1974.

James B. Gregory  
Administrator

**39 F.R. 4578**  
**February 5, 1974**

**PREAMBLE TO AMENDMENT TO PART 573—DEFECT REPORTS**

(Docket No. 69-31; Notice 6)

This notice responds to petitions for reconsideration of the amendment of 49 CFR Part 573, "Defect Reports," requiring the submission to NHTSA of the vehicle identification numbers (VIN) of motor vehicles found to contain safety related defects. The amendment was published February 5, 1974 (39 F.R. 4578). Except insofar as granted by this notice, the requests of the petitioners are denied.

Two petitions for reconsideration, one from General Motors Corporation and the other from Chrysler Corporation, were received. Both petitions objected to the requirement that VIN's be reported in the second quarterly report filed subsequent to the initiation of the defect notification campaign. Both pointed out that the NHTSA had stated in the amendment published February 5, 1974, that it was desirable to defer reporting VIN's until six months had passed from the time a notification campaign had begun. Both petitioners argued that the time for filing the second quarterly report is frequently less than six months, and suggested that the third quarterly report rather than the second was the more appropriate quarterly report to contain vehicle identification numbers. General Motors indicated that the average elapsed time from the initiation of a notification campaign to the filing of the second quarterly report is four and one-half months, while the elapsed time until the filing of the third quarterly report is, on the average, seven and one-half months. The NHTSA still believes it reasonable to allow a six-month period from the initiation of the campaign to elapse before VIN's are submitted. Accordingly, the NHTSA has granted the petitions insofar as they request that VIN's be reported in the third quarterly report submitted to NHTSA by the manufacturer.

Chrysler objected to the VIN reporting requirement generally, on the basis that it is unnecessary and will not produce the desired results. It is requested that an evaluation of the usefulness of the requirement be conducted after it is in effect, and that appropriate modifications be made if the requirement fails to achieve the desired results. General Motors requested that NHTSA maintain a public record of requests for VIN's so that future consideration can be given to the extent that the data is useful, and to whom it is useful. The NHTSA believes that public availability of VIN's will facilitate locating and repairing defective vehicles no longer in the hands of first purchasers. At the same time it agrees to conduct an evaluation of the efficacy of the requirement once it is in effect. The extent of usage is a relevant aspect of an evaluation of this type, and the NHTSA sees no prohibition against maintaining a public record of requests for the information.

The amended regulation will be effective August 6, 1974, and as such will require all third quarterly reports submitted to NHTSA on or after that date to contain appropriate vehicle identification numbers. The effective date has been changed from May 6, 1974, as a result of the change requiring the third rather than the second quarterly report to contain VIN's. As a practical matter, VIN's will be required to be reported in the third quarterly report for all defect notification campaigns initiated on or after January 1, 1974 (NHTSA campaign numbers 74-0001 and subsequent campaigns).

In light of the above, 49 CFR Part 573, Defect Reports, is amended by revising § 573.5(e) . . . .

Effective date: August 6, 1974.

Issued on May 6, 1974.

(Secs. 103, 112, 113, and 119, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1402, 1407, and the delegation of authority at 49 CFR 1.51; Office of Management and Budget approved 04-R5628.)

Gene G. Mannella  
Acting Administrator

**39 F.R. 16469**  
**May 9, 1974**



## PREAMBLE TO AMENDMENT TO PART 573—DEFECT REPORTS

(Docket No. 74-7; Notice 2)

This notice amends Part 573—"Defect Reports" by revoking the requirement that manufacturers of motor vehicles report quarterly to the National Highway Traffic Safety Administration production figures for vehicles manufactured or imported during the calendar quarter. A notice of proposed rulemaking in which this amendment was proposed was published January 15, 1974 (39 FR 1863).

The NHTSA is revoking the requirement for the reporting of quarterly production figures because it has found that the value of the information has not justified the burden on manufacturers of providing it. This amendment will eliminate the need for manufacturers to file quarterly reports unless they are conducting notification campaigns during the calendar quarter.

The notice of proposed rulemaking of January 15, 1974, proposed to extend the applicability of the Defect Reports regulations to include manufacturers of motor vehicle equipment, and to modify the information required to be reported. Since the issuance of this proposal, Congress has amended sections of the National Traffic and Motor Vehicle Safety Act which deal with manufacturers' responsibilities for safety related defects in motor vehicles and motor vehicle equipment. (Pub. L. 93-492, Oct. 27, 1974) These amendments to the Safety Act in part enlarge the responsibilities of manufacturers of motor vehicle equipment for safety related defects. Ultimately the Defect Reports regulations will reflect completely the expanded scope of the statutory amendments. While the language of

the proposed rule of January 15, 1974, is in most cases sufficiently broad to reflect these statutory changes, the scope of the proposal under the previous language of the Safety Act is materially different. Consequently, the NHTSA has decided to issue a further notice, with opportunity for public comment, that specifically reflects the expanded scope of the statutory amendments. This notice will be issued at some time following the effective date (December 26, 1974) of the statutory amendments.

The NHTSA has determined, however, that relief from the production-figures reporting requirements should not be further deferred, and by this notice deletes those requirements from the Defect Reports regulation.

In light of the above, 49 CFR Part 573, Defect Reports, is amended by revoking and reserving paragraph (b) of section 573.5 ("Quarterly reports").

Effective date: December 10, 1974. This amendment relieves a restriction and imposes no additional burden on any person. Consequently good cause exists and is hereby found for an effective date less than 30 days from publication.

(Secs. 108, 112, 113, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1397, 1401, 1402, 1408; delegation of authority at 49 CFR 1.51)

Issued on December 4, 1974.

James B. Gregory  
Administrator

39 F.R. 43075  
December 10, 1974



## PREAMBLE TO AMENDMENT TO PART 573—DEFECT AND NONCOMPLIANCE REPORTS

(Docket No. 74-7; Notice 4)

This notice amends Part 573, *Defect and Non-compliance Reports*, by adding reporting requirements for equipment manufacturers and altering somewhat the requirements for vehicle manufacturers as authorized by the 1974 Motor Vehicle and Schoolbus Safety Amendments. The amended regulation requires the submission of reports to the agency concerning defects and noncompliance with safety standards and specifies the information to be included in those reports.

*Effective date:* January 25, 1979.

*Addresses:* Petitions for reconsideration should refer to the docket number and be submitted to: Room 5108, Nassif Building, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

*For further information contact:*

Mr. James Murray, Office of Defects Investigation, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2840)

*Supplementary information:*

This notice amends Part 573, *Defect and Non-compliance Reports*. A notice of proposed rule-making was published on September 19, 1975 (40 F.R. 43227), proposing new requirements for vehicle and equipment manufacturers regarding submittal to the NHTSA of defect and noncompliance reports as authorized by the Motor Vehicle and Schoolbus Safety Amendments of 1974 (the Amendments) (Pub. L. 93-492).

Sections 151 to 160, or Part B of the Amendments alter the defect notification requirements of the National Traffic and Motor Vehicle Safety Act of 1966 ("the Act") (15 U.S.C. 1381 *et seq.*). These Amendments require manufacturers of motor vehicle replacement equipment to notify purchasers and to remedy any defects or noncompliances following the manufacturer's or the

Administrator's determination that the equipment contains either a defect which relates to motor vehicle safety or a noncompliance with an applicable Federal motor vehicle safety standard. Prior to the enactment of these provisions, manufacturers of motor vehicle equipment were responsible under the Act for notification of defects or noncompliances only following a determination by the National Highway Traffic Safety Administrator that the item of equipment contained a safety-related defect or failed to comply (Sec. 113(e), Pub. L. 89-563, 15 U.S.C. 1402).

Comments on the proposal were received from manufacturers, safety organizations, and manufacturer representatives. The Vehicle Equipment Safety Commission did not submit comments. All comments were considered and the most significant ones are discussed below.

### I. Scope.

Several manufacturers objected to the scope of the regulation indicating that it exceeded the agency's authority to regulate vehicle and equipment manufacturers. For example, manufacturers alleged that the agency only has authority over safety-related defects and accordingly should restrict the defects mentioned in this section to safety-related defects. Further, many equipment manufacturers apparently thought that they would be required to retain purchaser and owner lists of all vehicles containing items of their equipment.

The intent of this regulation is not to impose upon equipment manufacturers recordkeeping requirements for all equipment that they manufacture. This regulation merely imposes limited recordkeeping requirements for that equipment which is determined to be defective or in noncompliance. In other words, an equipment manufacturer, after discovery of a defect or



noncompliance, would ascertain from a vehicle manufacturer the identity of the vehicles and vehicle owners possessing the affected equipment. Notification would then be sent to those owners. The NHTSA would require that the equipment manufacturer retain the records of those sent notice of the defect.

Several manufacturers requested that the agency limit the applicability of this regulation to safety-related defects. They argued that the NHTSA has no authority to require information pertaining to non-safety-related defects. Section 158 of the Act specifically authorizes the agency to require information on any defect, whether or not safety-related, in order to enable it to undertake defect investigations which permit a determination regarding the safety-related nature of the defect. Much of this regulation pertains only to safety-related defects and each section indicates whether it applies to all defects or only those that are safety related.

## **II. Application.**

Many manufacturers complained about the use of the term "direct control" in Section 573.3(a). Some manufacturers contended that the use of the term was unnecessary. Importers contended that they should not be required to submit reports where a defect is identified before the vehicles leave their direct control since the Act considers them to be manufacturers and they would be in direct control of vehicles being imported. The Center for Auto Safety would have the agency drop the term and replace it with "beyond their place of final manufacture."

In the notice of proposed rulemaking, the NHTSA indicated the reasoning for excluding vehicles and equipment within the "direct control" of the manufacturer from the reporting requirements. Vehicles and equipment within the direct control of manufacturers are virtually assured of remedy of any defect or noncompliance, because they are still within the physical possession of the manufacturer. In the NPRM it was noted that direct control does not include in the possession of a dealer or distributor. For vehicles and equipment possessed by those entities, reports concerning defects or noncompliance would be required to be submitted to the agency. The agency declines to adopt the suggestion of the

Center for Auto Safety for reasons explained in the NPRM. The phrase "beyond the place of final manufacture" is not broad enough to handle all instances where vehicles are still within the direct control of the manufacturer. For example, vehicles might be stored on a manufacturer's lot far removed from the place of manufacture. Nonetheless, these vehicles are still within the direct control of the manufacturer. Therefore, the agency concludes that the term "direct control" best accomplishes the objective of providing a limited exclusion from the reporting requirements. The agency agrees with importers that since they are considered manufacturers under the Act, vehicles that manifest defects while they are within their direct control are excluded from the reporting requirements.

Some manufacturers apparently misunderstood the requirements of Section 573.3(d). Manufacturers indicated that reports should be required to be filed either by the brand name owner or the manufacturer, not by both. The section as written permits this. Compliance with the reporting requirements by the brand name owner shall be considered compliance by the manufacturer. Either one is permitted to submit the required reports. The Act treats tire brand name owners as manufacturers. Therefore, the wording of this section has been changed to reflect the responsibility of tire brand name owners.

Several commenters requested that the name of fabricating manufacturers not be submitted since this might cause competitive disadvantage to the brand name or trademark owner. The NHTSA finds it a legitimate need to know the actual manufacturer of a product. That manufacturer could, for example, be manufacturing the same or similar components for other brand name or trademark owners. The agency would need this information to ensure that all potentially defective or noncomplying equipment is remedied.

Many manufacturers complained of the requirements in Section 573.3(f) that reports be filed both by the equipment manufacturer and the vehicle manufacturer where an equipment manufacturer's equipment has been used by more than one vehicle manufacturer. Manufacturers stated that this requirement is duplicative and costly, providing identical information from both

sources. The NHTSA stated in the NPRM that this issue had been thoroughly considered prior to the issuance of the NPRM. It has again been explored by the agency in response to these comments and the agency concludes that the dual reporting requirement for the 573.5 report is necessary. Reports submitted by equipment and vehicle manufacturers will have different information in them. In both cases, the information is of importance to the agency in pursuing its defects and noncompliance obligations. Therefore, this requirement has been retained. It should be reaffirmed for clarity that where an equipment manufacturer's equipment is used in vehicles of only one vehicle manufacturer, reports need only be submitted by that vehicle manufacturer.

On a related matter, the NHTSA agrees that reports required under Section 573.6 need not be filed by both vehicle and equipment manufacturers. These reports need only be filed by the manufacturer undertaking the recall. Section 573.3(f) has been amended to reflect this change.

Other commenters on this section indicated their disapproval of the shared responsibility for remedying defects and noncompliance between vehicle and equipment manufacturers. Section 573.3 places certain reporting responsibilities upon both equipment and vehicle manufacturers, depending upon the nature of the defect. For the most part, vehicle manufacturers are responsible for reports relating to defects or noncompliance in their vehicles while equipment manufacturers are responsible for reports on their defective or noncomplying equipment. In those instances where a defect or noncompliance is discovered in equipment installed in the vehicles of more than one vehicle manufacturer, both the equipment and vehicle manufacturers must report. Equipment manufacturers suggested that vehicle manufacturers should be responsible for defects and noncompliance reports while vehicle manufacturers want to place the burdens upon equipment manufacturers. The NHTSA adopted the present scheme of shared responsibility between vehicle and equipment manufacturers for compliance with agency regulations in response to the 1974 Amendments. Congress indicated in those amendments that equipment and vehicle manufacturers should share the burden of rem-

edying defects in their equipment and vehicles. The NHTSA concludes that the reporting requirements outlined in this regulation implement the basic intent of those Amendments.

### III. Definitions.

Many commenters objected to the definitions of original and replacement equipment. Further, some of these commenters indicated that the NHTSA had little, if any, authority to place responsibility on an original equipment manufacturer, since Section 159 of the Act makes the vehicle manufacturers responsible for original equipment. The NHTSA has deleted the definitions of original and replacement equipment from Part 573 since both terms are defined in Part 579. The NHTSA notes that with respect to the authority to place responsibility for defects or noncompliance upon original equipment manufacturers rather than the vehicle manufacturer, Section 159 states that the Act's defect and noncompliance scheme of responsibility shall be controlling unless otherwise provided by regulation. Therefore, the NHTSA does have the authority to shift the responsibility from the vehicle manufacturer to the equipment manufacturer if it determines that such alteration will advance the efficiency of enforcement actions. Part 579, *Defect and Noncompliance Responsibility*, outlines the responsibilities of the various manufacturers and defines "replacement" and "original" equipment.

Commenters also requested that the agency define the term "safety-related defect" so as to clarify the agency's intent in this area. The NHTSA has in the past rejected requests to establish a specific definition of safety-related defect. Whether or not a defect is safety-related depends upon a variety of factors and must be ascertained based upon the circumstances of each separate case. Thus, a specific definition cannot feasibly be created.

Ford Motor Company argued that the agency's preambular discussion tended to indicate that the definition of "first purchaser for purposes other than resale" would include the dealer or distributor. This was not the intent of the regulation. "First purchaser" is based on a similar statutory term and has been used by the agency for years with a specific meaning. The first purchase oc-



curs where the purchaser does not buy the vehicle with the purpose of reselling it. Obviously, sale of a vehicle to a dealer presupposes that the dealer intends to resell the vehicle to the ultimate consumer or purchaser. Therefore, sale to a dealer would not constitute the sale to the first purchaser for purposes other than resale. The use of the term first-purchaser list in the preamble of the proposal in reference to the lists required to be retained by equipment manufacturers was a colloquial use of the term rather than its more precise meaning under the Act.

#### **IV. Defect and noncompliance information reports.**

Prestolite Company interpreted the requirements of Section 573.5(a) to mean that they would be required to file a report with the NHTSA every time a defective piece of equipment was brought to their attention, since there is no specific definition of safety-related defect. This they suggested would be a burdensome requirement. Such a requirement is not the intent of this regulation. A manufacturer submits a report to the NHTSA when either it or the agency makes a determination under Section 151 or 152 of the Act that a defect related to motor vehicle safety in fact exists. A failure of a single piece of equipment may not occasion the finding of a safety-related defect. Further, some equipment failures might have no adverse safety effects. Therefore, every failure of equipment will not necessarily require a report to the NHTSA. It is incumbent upon the agency and each manufacturer to make a good faith determination concerning the safety relatedness of any defect before a report under this paragraph is filed.

International Harvester (IH) suggested that a manufacturer should not have to file a report if it intends to file a petition for inconsequentiality. The NHTSA does not agree with this position. The agency needs to know of potential safety-related defects or noncompliances at the earliest possible time. If a manufacturer intends to file a petition for inconsequentiality, it should indicate such in the report as part of the information supplied in accordance with subparagraph (c) (8).

Many manufacturers objected to the 5-day requirement in Section 573.5(b) under which information must be submitted within 5 working days

after a safety-related defect or noncompliance has been discovered. Manufacturers suggested increasing the number of working days and changing the word "submitted" to "mailed." Ford requested that the 5-day period not begin until written notification is received from the NHTSA for agency-initiated determinations.

The agency does not find persuasive arguments for altering the existing 5-working day requirement. The NHTSA needs this information as rapidly as possible to aid expeditious notification and recall. Not all information need be supplied within the 5 working days if some of it is unavailable. The regulation clearly states that any unavailable information would be submitted later as it becomes available. The NHTSA also considers it unnecessary to change the word "submitted" to "mailed." The term "submitted" is broader than "mailed." Information may be submitted by mailing it or delivering it to the agency in person. If mailed, it must be mailed within 5 working days.

With respect to the alleged insufficient time to prepare information in 5 working days, the NHTSA notes that this requirement has existed in Part 573 for several years. Since the requirement has operated smoothly for that period of time, the agency declines to adopt recommendations that would change it.

The NHTSA declines to adopt Ford's recommendation concerning agency-initiated determinations. Agency initiated defect or noncompliance determinations are made after thorough investigations conducted by the NHTSA. A manufacturer is aware of these ongoing investigations, and therefore, it should not be unnecessarily burdened or surprised when the NHTSA makes a determination. Since the need for expeditious action exists after an agency determination and the manufacturer is aware of a pending agency decision, the NHTSA considers it adequate that a manufacturer submit the report in 5 working days after receipt of either written or oral agency notification.

Several equipment manufacturers contended that the requirements of paragraph (c) (2) would impose additional burdens upon them to mark the equipment that they manufacture. Paragraph (c) (2) requires defect and noncompliance reports



to contain certain information that identifies the defective or noncomplying equipment. For example, they argued that the requirements for the date of manufacture of the affected equipment would be burdensome since much of their equipment is not dated according to time of manufacture. Therefore, they suggested that the NHTSA only require date of manufacture information when it is known.

It is important to remember that Part 573 is for the most part a reporting regulation. It is not a recordkeeping or labeling regulation. A manufacturer, under the regulation, only supplies to the NHTSA that information which is available to it. In the case of date of manufacture of equipment, the equipment manufacturer in most instances need not label its equipment in such a manner as to identify its date of manufacture. The regulation merely directs a manufacturer to supply such information to the NHTSA in its reports. Obviously, if a manufacturer does not know the dates of manufacture, it would be unable to supply them to the agency. However, a manufacturer must supply the approximate dates of manufacture if that information is available.

Manufacturers should note that the manufacturing date requirement is included in the regulation for the benefit of the equipment manufacturer. If that manufacturer knows the approximate dates when a defective piece of equipment was produced, then its recall can be limited to equipment manufactured during those dates. On the other hand, a manufacturer without such information might be required to undertake a more extensive recall of its equipment to ensure that all defective products are recalled.

The Center for Auto Safety requested that the NHTSA require motor vehicle manufacturers to submit the vehicle identification numbers (VIN) of vehicles involved in any recall activity. The NHTSA does not require this information in the Part 573.5 reports because the agency normally has no need at the time of the reports issuance for such information. The agency does require the VIN's to be submitted in the Part 573.6 reports for those vehicles that are uncorrected in a manufacturer's recall. In these instances, the agency uses the information to supplement a

manufacturer's recall efforts. Until such time as a manufacturer determines that some vehicles are uncorrected however, the agency usually has little use for VIN information on all recalled vehicles. In those limited instances when VIN information is necessary at the time of submission of the Part 573.5 report, the agency has the ability to request it from a manufacturer.

In regard to paragraph (c)(3), several manufacturers objected to the requirement that the precise number of vehicles or equipment in each category be reported. These manufacturers stated that often this information is not known. The NHTSA agrees and therefore modifies the section to require the submittal of this information when it is known. Chrysler suggested that the agency require the numbers of affected vehicles to be submitted by GVWR breakdown rather than by model. The agency disagrees with this recommendation since it usually undertakes recalls based upon model classification, not upon GVWR categories. Therefore, the submission of information based upon a GVWR classification would not be as useful as a classification based upon vehicle model.

Atlas Supply Company suggested that the agency not require the information specified in paragraph (c)(4) since, for tire manufacturers, tires are destroyed, making the required calculations difficult. Paragraph (c)(4) requires the provision of information that estimates the percentage of defective or noncomplying equipment on vehicles. The NHTSA considers estimates of the amount of affected vehicles or equipment to be necessary to obtain an idea of the scope of the defect or noncompliance problem. Since the section merely requires an estimate, the agency does not consider this to place a difficult burden upon manufacturers.

Many manufacturers complained about the requirements of paragraph (c)(6) which requires the submission of information upon which the determination was made that a safety-related defect exists. These manufacturers indicated that it would impose unreasonable burdens upon manufacturers by requiring them to retrieve a large amount of information in a short period of time and to retain vast amounts of data. The intent of this section is to provide a summary to the NHTSA of the information upon which a

manufacturer based his defect determination. This information, since it has been used by a manufacturer for its determination of a defect, should be readily available to it. The NHTSA notes that the submission of summary information is intended to reduce a manufacturer's burdens. However, the specificity and clarity of information must be maintained, and the agency might require further information if the summary information is inadequate. The NHTSA has reworded the paragraph somewhat to indicate that it is only necessary to submit a summary of the information upon which the determination was based.

Several manufacturers suggested that the requirement for submission of noncompliance test data in paragraph (c)(7) would require them to conduct tests and submit details of test procedures to the agency. This paragraph requires only that manufacturers supply the results and data of tests, if any are conducted, upon which a noncompliance determination was based. Test procedures need not be submitted. If a noncompliance determination is made on information other than tests, then that information would be submitted.

Manufacturers claimed that they would be unable to submit a plan for remedy as required by paragraph (c)(8) in the required 5 working days. The NHTSA needs to have an indication of a manufacturer's plan for remedy as soon as possible. Like all of the information required by this section, the plan need not be extensively detailed in the initial 5-working day period and is subject to modification if subsequent circumstances warrant a change. In other words, a manufacturer is not binding itself to only those items established in the plan submitted during the first 5 days after a defect or noncompliance has been determined to exist. The NHTSA has amended the wording of this paragraph somewhat to indicate that a copy of a manufacturer's plan for remedying a defect or noncompliance will be made public in the NHTSA docket.

The Center for Auto Safety argued that paragraph (c)(9) should require actual copies of the defect or noncompliance notice bulletins or communications, not representative copies. The reason the NHTSA used the terminology con-

tained in the notice is that in some instances a manufacturer has a multiple mailing of one communication. To require actual copies of multiple mailings would require copies of each of these identical communications. Therefore, the agency allows a representative copy (e.g., one actual copy) of such information. The NHTSA concludes that this requirement fulfills the agency's need for accurate copies.

#### **V. Quarterly defect reports.**

Many manufacturers disagreed with the agency's scheme for quarterly defect reports outlined in Section 576.6. Equipment manufacturers suggested that vehicle manufacturers should be responsible for these reports, while vehicle manufacturers asserted that the equipment manufacturers are better able to accomplish the reporting requirements. The NHTSA requires any manufacturer, either vehicle or equipment, undertaking a recall to comply with the quarterly reporting requirement. This report tells the agency the status of recalls, and therefore, is best accomplished by the party conducting the recall. The NHTSA declines to adopt suggestions that would change this scheme.

Subparagraph (b)(6) requires the submission of information on the number of vehicles or equipment that is determined to be unreachable. Several manufacturers argued for deletion of this information suggesting that it was impossible to ascertain why certain vehicles or equipment are unreachable. The manufacturer need only give the reasons why vehicles are unreachable when such information is available to him. This information aids the agency in understanding the effectiveness of a recall. The agency can determine from this data the number of vehicles still in use that were not corrected by a manufacturer and why.

#### **VI. Purchaser and owner lists.**

The intent of this section was misunderstood by a number of commenters. Many manufacturers, both equipment and vehicle, indicated that this requirement burdened them with new record-keeping requirements far beyond those currently in existence. This is not the case. For example, Part 573.7(a) requires vehicle manufacturers to maintain lists of owners of vehicles involved in a



notification campaign, not all vehicles produced. General recordkeeping requirements for vehicle and equipment manufacturers are found in the Act and in the agency's regulations in Part 576. These general recordkeeping requirements are not affected by this regulation.

Equipment manufacturers strenuously objected to paragraph (c) as placing huge recordkeeping burdens upon them while achieving little in the way of benefits. The agency does not find these arguments persuasive. The recordkeeping requirement in this paragraph is limited. The agency has reworded this section to clarify an equipment manufacturer's recordkeeping requirements. This requirement does not mandate an equipment manufacturer to make and retain a list of all purchasers of its equipment as the equipment is sold. Equipment manufacturers will be required to retain a list of individuals, dealers, distributors and manufacturers determined by the manufacturer or the agency to be in possession of potentially defective or noncomplying equipment. This limited requirement is within the authority granted by Section 112(b) of the Act. The list would be compiled during the course of a defect or noncompliance campaign. If an equipment manufacturer is unable to find those in possession of its equipment, no list is required to be retained. The burden imposed by this requirement is minimal since it merely requires that manufacturers retain some information that will, by necessity, be generated should they be required to conduct either a defect or noncompliance campaign.

With respect to paragraph (b), tire manufacturers indicated that each tire does not have a different identification number and therefore the paragraph should be amended somewhat to reflect this. The agency agrees and has modified the language accordingly.

#### **VII. Notices, bulletins, and other communications.**

Many manufacturers objected to the requirements in Section 573.8 as being too broad and beyond the scope of the NHTSA's authority. This section requires the submission of information concerning defects in equipment and vehicles. Further, the manufacturers recommended that the parentheticals be deleted from the section and

that the term "defect" be changed to "safety-related defect." The agency does not agree with these comments.

First, the agency needs information concerning any defect in a manufacturer's product, not just those defects that a manufacturer deems to be safety-related. The Act contemplates a two-pronged approach to defects determinations. Either a manufacturer or the agency can make such a determination. For the agency to carry out its half of that responsibility, it needs information pertaining to all defects so that it can then judge for itself whether a defect is in fact safety related. To require only information pertaining to manufacturer-determined safety-related defects, would in effect mean that manufacturers would not be required to submit defect information to the agency until such time as that manufacturer had made a safety-related defect determination. This would stymie the agency's ability to make independent judgments concerning defects that is necessary for proper enforcement of the Act. In the past year, the NHTSA has made several safety-related defect determinations on the basis of information routinely submitted by manufacturers concerning defects that they had not considered safety-related. For example, some Airstream Trailers and White Trucks were recalled when the agency discovered safety-related problems that were mentioned in those companies' technical bulletins. Therefore, the agency needs all types of defect information, not just information that manufacturers determine to be safety-related.

Second, the parentheticals were added to this section to help clarify the type of information intended to be covered by its requirements. These lists are not all-inclusive. The NHTSA concludes, however, that they do clarify the type of information the agency seeks to obtain from a manufacturer, and therefore, they will be retained in the regulation.

The agency has deleted from Section 573.8 all references to noncompliances. All noncompliances must be reported to the agency under Part 573.5 (c) (9). Therefore, it is unnecessary to include references to noncompliances in this paragraph.

In response to the allegations that the agency has no authority to require submittal of defect



information, whether or not safety related, Section 158 of the Act specifically grants the agency that authority.

**VIII. Address for submitting required reports and other information.**

The address listed in Part 573.9 has been altered to reflect the new agency organization and authority for enforcement actions.

In accordance with agency policy, the NHTSA has considered the costs and benefits of this requirement. The agency concludes that the regulation will help enforcement of defect and noncompliance cases by ensuring that adequate information is submitted to the NHTSA. The costs to both industry and government of the regulation will be less than \$5 million annually.

The principal authors of this notice are James Murray of the Office of Defects Investigation and Roger Tilton of the Office of Chief Counsel.

In consideration of the foregoing, Part 573, *Defect and Noncompliance Reports*, of Volume 49 of the Code of Federal Regulations is amended. . . .

(Secs. 108, 112, 119, Pub. L. 89-563, 80 Stat. 718; Secs. 102, 103, 104, Pub. L. 93-492; 88 Stat. 1470; 15 U.S.C. 1397, 1401, 1408, 1411-1420; delegation of authority at 49 CFR 1.50.)

Issued on December 18, 1978.

Joan Claybrook  
Administrator

**43 F.R. 60165-60169  
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## PART 573—DEFECT AND NONCOMPLIANCE REPORTS

(Docket No. 74-7; Notice 4)

### Sec.

#### 573.1 Scope.

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#### 573.4 Definitions.

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#### 573.8 Notices, bulletins, and other communications.

#### 573.9 Address for submitting required reports and other information.

AUTHORITY: Sec. 108, 112, 119, Pub. L. 89-563, 80 Stat. 718; Secs. 102, 103, 104, Pub. L. 93-492; 88 Stat. 1470; 15 U.S.C. 1397, 1401, 1408, 1411-1420; delegations of authority at 49 CFR 1.50 and 49 CFR 501.8

### § 573.1 Scope.

This part specifies requirements for manufacturers to maintain lists of purchasers and owners of defective and noncomplying motor vehicles and motor vehicle original and replacement equipment, and for reporting to the National Highway Traffic Safety Administration defects in motor vehicles and motor vehicle equipment, for reporting nonconformities to motor vehicle safety standards, for providing quarterly reports on defect and noncompliance notification campaigns, and for providing copies to NHTSA of communications with distributors, dealers, and purchasers regarding defects and noncompliances.

### § 573.2 Purpose.

The purpose of this part is to inform NHTSA of defective and noncomplying motor vehicles

and items of motor vehicle equipment, and to obtain information for NHTSA on the adequacy of manufacturers' defect and noncompliance notification campaigns, on corrective action, on owner response, and to compare the defect incidence rate among different groups of vehicles.

### § 573.3 Application.

(a) This part applies to manufacturers of complete motor vehicles, incomplete motor vehicles, and motor vehicle original and replacement equipment, with respect to all vehicles and equipment that have been transported beyond the direct control of the manufacturer.

(b) In the case of a defect or noncompliance determined to exist in a motor vehicle or equipment item imported into the United States, compliance with §§ 573.5 and 573.6 by either the fabricating manufacturer or the importer of the vehicle or equipment item shall be considered compliance by both.

(c) In the case of a defect or noncompliance determined to exist in a vehicle manufactured in two or more stages, compliance with §§ 573.5 and 573.6 by either the manufacturer of the incomplete vehicle or any subsequent manufacturer of the vehicle shall be considered compliance by all manufacturers.

(d) In the case of a defect or noncompliance determined to exist in an item of replacement equipment (except tires) compliance with §§ 573.5 and 573.6 by the brand name or trademark owner shall be considered compliance by the manufacturer. Tire brand name owners are considered manufacturers (15 U.S.C. 1419(1)) and have the same reporting requirements as manufacturers.

(e) In the case of a defect or noncompliance determined to exist in an item of original equipment used in the vehicles of only one vehicle

manufacturer, compliance with §§ 573.5 and 573.6 by either the vehicle or equipment manufacturer shall be considered compliance by both.

(f) In the case of a defect or noncompliance determined to exist in original equipment installed in the vehicles of more than one vehicle manufacturer, compliance with § 573.5 is required of the equipment manufacturer as to the equipment item, and of each vehicle manufacturer as to the vehicles in which the equipment has been installed. Compliance with § 573.6 is required of the manufacturer who is conducting a recall campaign.

#### **§ 573.4 Definitions.**

For purposes of this part:

“Act” means the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1391 *et seq.*).

“Administrator” means the Administrator of the National Highway Traffic Safety Administration or his delegate.

“First purchaser” means first purchaser for purposes other than resale.

#### **§ 573.5 Defect and noncompliance information report.**

(a) Each manufacturer shall furnish a report to the NHTSA for each defect in his vehicles or in his items of original or replacement equipment that he or the Administrator determines to be related to motor vehicle safety, and for each noncompliance with a motor vehicle safety standard in such vehicles or items of equipment which either he or the Administrator determines to exist.

(b) Each report shall be submitted not more than 5 working days after a defect in a vehicle or item of equipment has been determined to be safety-related, or a noncompliance with a motor vehicle safety standard has been determined to exist. Information required by paragraph (c) of this section that is not available within that period shall be submitted as it becomes available. Each manufacturer submitting new information relative to a previously submitted report shall refer to the notification campaign number when a number has been assigned by the NHTSA.

(c) Each manufacturer shall include in each report the information specified below.

(1) The manufacturer's name: The full corporate or individual name of the fabricating manufacturer and any brand name or trademark owner of the vehicle or item of equipment shall be spelled out, except that such abbreviations as “Co.” or “Inc.,” and their foreign equivalents, and the first and middle initials of individuals may be used. In the case of a defect or noncompliance determined to exist in an imported vehicle or item of equipment, the agent designated by the fabricating manufacturer pursuant to section 110(e) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1399(e)) shall be also stated. If the fabricating manufacturer is a corporation that is controlled by another corporation that assumes responsibility for compliance with all requirements of this part the name of the controlling corporation may be used.

(2) Identification of the vehicles or items of motor vehicle equipment potentially containing the defect or noncompliance.

(i) In the case of passenger cars, the identification shall be by the make, line, model year, the inclusive dates (month and year) of manufacture, and any other information necessary to describe the vehicles.

(ii) In the case of vehicles other than passenger cars, the identification shall be by body style or type, inclusive dates (month and year) of manufacture, and any other information necessary to describe the vehicles, such as GVWR or class for trucks displacement (cc) for motorcycles, and number of passengers for buses.

(iii) In the case of items of motor vehicle equipment, the identification shall be by generic name of the component (tires, child seating systems, axles, etc.), part number, size and function if applicable, the inclusive dates (month and year) of manufacture, and any other information necessary to describe the items.

(3) The total number of vehicles or items of equipment potentially containing the defect or noncompliance, and where available the number of vehicles or items of equipment in each group identified pursuant to paragraph (c)(2) of this section.



(4) The percentage of vehicles or items of equipment specified pursuant to paragraph (c)(2) of this section estimated to actually contain the defect or noncompliance.

(5) A description of the defect or noncompliance, including both a brief summary and a detailed description with graphic aids as necessary, of the nature and physical location (if applicable) of the defect or noncompliance.

(6) In the case of a defect, a chronology of all principal events that were the basis for the determination that the defect related to motor vehicle safety, including a summary of all warranty claims, field or service reports, and other information, with their dates of receipt.

(7) In the case of a noncompliance, the test results or other data on the basis of which the manufacturer determined the existence of the noncompliance.

(8) A description of the manufacturer's program for remedying the defect or noncompliance. The manufacturer's program will be available for inspection in the public docket, Room 5108, Nassif Building, 400 Seventh St., SW., Washington, D.C. 20950.

(9) A representative copy of all notices, bulletins, and other communications that relate directly to the defect or noncompliance and are sent to more than one manufacturer, distributor, dealer, or purchaser. These copies shall be submitted to the NHTSA not later than 5 days after they are initially sent to manufacturers, distributors, dealers, or purchasers. In the case of any notification sent by the manufacturer pursuant to Part 577 of this chapter, the copy of the notification shall be submitted by certified mail.

#### **§ 573.6 Quarterly reports.**

(a) Each manufacturer who is conducting a defect or noncompliance notification campaign to manufacturers, distributors, dealers, or purchasers, shall submit to NHTSA a report in accordance with paragraphs (b) and (c) of this section, not more than 25 working days after the close of each calendar quarter. Unless otherwise directed by the NHTSA, the information specified in paragraphs (b)(1) through (b)(6) of this section shall be included in the quarterly report, with respect to each notification campaign, for

each of six consecutive quarters beginning with the quarter in which the campaign was initiated (i.e., the date of initial mailing of the defect or noncompliance notification to owners) or corrective action has been completed on all defective or noncomplying vehicles or items of replacement equipment involved in the campaign, whichever occurs first. The information specified in paragraph (b)(7) shall be included only in the third quarterly report furnished pursuant to this section.

(b) Each report shall include the following information identified by and in the order of the subparagraph headings of this paragraph.

(1) The notification campaign number assigned by NHTSA.

(2) The date notification began and the date completed.

(3) The number of vehicles or items of equipment involved in the notification campaign.

(4) The number of vehicles or items of equipment estimated to contain the defect.

(5) The number of vehicles and equipment items of receiving corrective action, which shall be the sum of

(i) The number repaired; and

(ii) The number inspected and determined not to need repair.

(6) The number of vehicles or items of equipment determined to be unreachable for inspection due to export, theft, scrapping, failure to receive notification, or other reasons (specify). The number of vehicles or items of equipment in each category shall be specified.

(7) In the case of motor vehicles, the vehicle identification number for each vehicle for which corrective measures have not been completed.

(c) If the manufacturer determines that the original information submitted under paragraphs (b)(3), (b)(4), or (b)(6) of this section is incorrect, revised figures and an explanatory note shall be submitted. If the nature of the defect or noncompliance prevents determination of the information required by paragraph (b)(5) of this section, the manufacturer shall include a brief explanation. Information supplied in re-

sponse to paragraphs (b) (5) and (b) (6) of this section shall be cumulative totals.

#### **§ 573.7 Purchaser and owner lists.**

(a) Each manufacturer of motor vehicles shall maintain, in a form suitable for inspection such as computer information storage devices or card files, a list of the names and addresses of the registered owners, as determined through State motor vehicle registration records or other sources, or the most recent purchasers where the registered owners are unknown, for all vehicles involved in a defect or noncompliance notification campaign initiated after the effective date of this part. The list shall include the vehicle identification number for each vehicle and the status of remedy with respect to each vehicle, updated as of the end of each quarterly reporting period specified in § 573.6. Each list shall be retained, beginning with the date on which the defect or noncompliance information report required by § 573.5 is initially submitted to the NHTSA, for 5 years.

(b) Each manufacturer (including brand name owners) of tires shall maintain, in a form suitable for inspection such as computer information storage devices or card files, a list of the names and addresses of the first purchasers of his tires for all tires involved in a defect or noncompliance notification campaign initiated after the effective date of this part. The list shall include the tire identification number of all tires and shall show the status of remedy with respect to each owner involved in each notification campaign, updated as of the end of each quarterly reporting period specified in § 573.6. Each list shall be retained, beginning with the date on which the defect information report is initially submitted to the NHTSA, for 3 years.

(c) For each item of equipment involved in a defect or noncompliance notification campaign initiated after the effective date of this part, each manufacturer of motor vehicle equipment other than tires shall maintain, in a form suitable for inspection, such as computer information storage

devices or card files, a list of the names and addresses of each distributor and dealer of such manufacturer, each motor vehicle or motor vehicle equipment manufacturer and most recent purchaser known to the manufacturer to whom a potentially defective or noncomplying item of equipment has been sold, the number of such items sold to each, and the date of shipment. The list shall show as far as is practicable the number of items remedied or returned to the manufacturer and the dates of such remedy or return. Each list shall be retained, beginning with the date on which the defect report required by § 573.5 is initially submitted to the NHTSA for 5 years.

#### **§ 573.8 Notices, bulletins, and other communications.**

Each manufacturer shall furnish to the NHTSA a copy of all notices, bulletins, and other communications (including warranty and policy extension communiques and product improvement bulletins), other than those required to be submitted pursuant to § 573.5(c) (9), sent to more than one manufacturer, distributor, dealer, or purchaser, regarding any defect in his vehicles or items of equipment (including any failure or malfunction beyond normal deterioration in use, or any failure of performance, or any flaw or unintended deviation from design specifications), whether or not such defect is safety-related. Copies shall be submitted monthly, not more than 5 working days after the end of each month.

#### **§ 573.3 Address for submitting required reports and other information.**

All required reports and other information, except as otherwise required by this part, shall be submitted to the Associate Administrator for Enforcement, National Highway Traffic Safety Administration, Washington, D.C. 20590.

**43 F.R. 60169**

**December 26, 1978**



## PREAMBLE TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice No. 5)

On November 10, 1970, the National Highway Safety Bureau (now the National Highway Traffic Safety Administration, or NHTSA) published the Tire Identification and Recordkeeping Regulations (35 F.R. 18116). Thereafter, pursuant to § 553.35 of the rulemaking procedures (49 CFR Part 553, 35 F.R. 5119), petitions for reconsideration or petitions for rulemaking were filed by the American Retreaders' Association, Inc., the Armstrong Rubber Co., Bandag Inc., the National Tire Dealers & Retreaders Association, Inc., the Goodyear Tire & Rubber Co., the Lee Tire and Rubber Co., Chrysler Corp., the Rubber Manufacturers Association, Ford Motor Co., the Kelly-Springfield Tire Co., Pirelli Tire Corp., the B. F. Goodrich Co., Uniroyal Tire Co., Cooper Tire & Rubber Co., Michelin Tire Corp., the Firestone Tire & Rubber Co., White Motor Corp., Bert Schwarz-S&H Inc., and the Truck Trailer Manufacturers Association. Several petitioners requested the opportunity to demonstrate difficulties they were having meeting the regulation as issued, and as a result a public meeting was held December 21, 1970. Notice of the meeting was published in the *Federal Register* (35 F.R. 19036) and the transcript of the meeting is in the public docket. The substance of the petitions and comments made at the meeting have been considered. Certain parts of the Tire Identification and Recordkeeping Regulation are hereby amended.

The definition of "Tire brand name owner" in § 574.3(c) is changed to make it clear that a person manufacturing a brand name tire that he markets himself is not a brand name owner for the purposes of this regulation.

The regulation is amended to except from its requirements tires manufactured for pre-1948 vehicles. This exception is consistent with the

Federal Motor Vehicle Safety Standard for passenger car tires (Standard No. 109).

After consideration of the comments in the petitions concerning the tire identification number requirements, several changes have been made.

1. Section 574.5 is amended to specify the numbers and letters to be used in the identification number.

2. Figures 1 and 2 are modified to allow three-quarters of an inch, instead of one-half inch, between the DOT symbol and the identification number and between the second and third grouping. Tires with cross section width of 6 inches or less may use  $\frac{5}{32}$ -inch letters. The DOT symbol may be located to the right of the identification number as well as above, below, or to the left of the identification number. Retreaders, as well as new tire manufacturers, may locate the DOT symbol above, below, to the left, or to the right of the identification number. The minimum depth of the identification number has been changed from 0.025 inch to 0.020 inch, measured from the surface immediately surrounding the characters.

3. The second grouping, identifying the tire size, has been changed with respect to retreaded tires to provide that if a matrix is used for processing the retreaded tire the code must identify the matrix used. The change requiring retreaded tire identification numbers to contain a matrix code rather than a size code was made because, in the event of a defect notification, the matrix would be a more meaningful method of identifying the suspect tires and it was considered impracticable to require retreaders to include the tire size in the tire-identification number.

4. The third grouping, for identifying the significant characteristics of the tire, has been changed to provide that if a tire is manufactured



for a brand name owner the code shall include symbols identifying the brand name owner, which shall be assigned by the manufacturer rather than by the NHTSA. Manufacturers are required to provide the NHTSA with the symbols assigned to brand name owners upon the NHTSA's request. This change should result in a shorter identification number and allow manufacturers greater flexibility in the use of the third grouping.

Standard No. 109 presently requires that passenger car tires contain a DOT symbol, or a statement that the tire complies with the standard, on both sidewalls of the tire between the section width and the bead. The requirement in Standard No. 109 is being changed by notice published in this issue (36 F.R. 1195 to provide that the DOT symbol may be on either sidewall, in the location specified by this regulation. The requested change that the DOT symbol be allowed on tires for which there is no applicable standard in effect is denied, since such use would tend to give consumers the impression those tires were covered by a Federal standard.

Several petitioners requested that other DOT symbols (located as required by the present Standard No. 109) be permitted to remain on the tire along with the three-digit manufacturer's code number assigned pursuant to that standard. The Tire Identification and Record-keeping regulation does not prohibit the continued use of the symbol and code number provided the numbers are not close enough to the identification number to be confused with it. In no event should the three-digit number, formerly required by Standard No. 109, immediately follow the tire identification number.

As a result of petitions by vehicle manufacturers the requirement in § 574.10 that vehicle manufacturers maintain the record of tires on each vehicle shipped has been changed to eliminate the requirement that this information be maintained by identification number. It would evidently be extremely difficult and expensive for the vehicle manufacturer to record each tire identification number. Vehicle manufacturers have stated that their present system provides records that enable them to notify the purchaser of a vehicle that may contain suspect tires.

Several petitioners requested that the effective date of the regulation be extended beyond May 1, 1971. The 1970 amendment to the National Traffic and Motor Vehicle Safety Act requires that the provisions relating to maintaining records of tire purchasers shall be effective not later than 1 year after the date of enactment of these amendments (May 22, 1971). It has been determined that in view of the complexities involved in establishing the recordkeeping system required and the effect of the same on existing processes, good cause exists for making the regulations effective on the latest date manufacturers are required by statute to maintain records. It is further determined that a May 22, 1971, effective date is in the public interest.

Effective date: May 22, 1971.

Issued on January 19, 1971.

Douglas W. Toms,  
Acting Administrator, National  
Highway Traffic Safety Ad-  
ministration.

36 F.R. 1196  
January 26, 1971

**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND  
RECORDKEEPING**

**(Docket No. 70-12; Notice No. 9)**

**Amendment to Figure 2 Concerning the Location of the Tire Identification Number  
for Retreaded Tires**

The purpose of this amendment is to provide retreaders with an alternative location for the placement of the tire identification number.

On January 26, 1971, the National Highway Traffic Safety Administration published Docket No. 70-12, Notice No. 5, a revised version of the Tire Identification and Record Keeping Regulation, 49 CFR Part 574 (36 F.R. 1196). Section 574.5 requires retreaders to permanently mold or brand into or onto one sidewall a tire identification number in the manner specified in Figure 2 of the regulation. Figure 2 requires that the tire identification number be located in the area of the shoulder between the tread edge and the maximum section width of the tire. The regulation specified this location because, generally, it is the area upon which retreaders apply new retread material.

Bandag, Inc., has petitioned for rulemaking to allow the tire identification to be below the section width of the tire. The petition requests this relief because the Bandag process only affects the tread surface, a comparatively smooth surface is needed for application of the identification number, and many casings have no smooth area

between the tread edge and the maximum section width.

Therefore, in view of the above, Figure 2 of Part 574 (36 F.R. 1200) is hereby amended as set forth below to require that the tire identification number be on one sidewall of the tire, either on the upper segment between the maximum section width and the tread edge, or on the lower segment between the maximum section width and bead in a location such that the number will not be covered by the rim flange when the tire is inflated. In no event should the number be on the surface of the scuff rib or ribs.

*Effective date:* May 22, 1971.

Because this amendment relieves a restriction and does not impose any additional burden on any person it is found that notice and public procedure thereon are unnecessary and impracticable, and that, for good cause shown, an effective date less than 30 days after the date of issuance is in the public interest.

Issued on May 21, 1971.

Douglas W. Toms  
Acting Administrator





**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORD KEEPING**

(Docket No. 70-14; Notice 15)

The purpose of this amendment to Part 574 of Title 49, Code of Federal Regulations, is to provide that the second group of symbols within the tire identification number shall, in the case of new tires, be assigned at the option of the manufacturer rather than conforming to the tire size code presently found in Table I of the regulation.

Under the present system, even if the presently unassigned symbols "O" and "R" are used, a maximum of 900 tire size codes can be assigned. Due to the many new tire sizes being introduced, it is necessary to change the system to allow more flexibility. Therefore, Table I is herewith deleted, new tire manufacturers are allowed to assign their own two-digit code for the tire size, and retreaders are allowed to use either a self-assigned matrix code or a self-assigned tire size code. Each new tire manufacturer will still be required to use a two-symbol size code and to maintain a record of the coding system used, which shall be provided to the National Highway Traffic Safety Administration upon written request. It is recommended but not required that manufacturers use the code sizes previously assigned by this agency for active sizes, and reuse the codes for obsolete sizes when additional size codes are needed.

A notice of proposed rulemaking on this subject was published on June 16, 1972 (37 F.R. 11979). The comments received in response to the notice have been considered in the issuance of this final rule. The rule is issued as it appeared in the proposal including the letter "T" inadvertently omitted from the proposal.

Three of the tire manufacturers who commented favored the proposed change, and the National Tire Dealers and Retreaders Association, the Japan Automobile Manufacturers Association and The European Tyre and Rim

Technical Organisation commented without objection to the proposed change.

Bandag, Inc., a retreader of tires, objected to the proposed change on the grounds that allowing tire manufacturers to assign their own tire size code would remove one of the methods a retreader has to determine the tire size of a casing to be retreaded.

Mercedes-Benz of North America and Volkswagen of America did not favor the change because of the possibility of confusion for the vehicle manufacturer that equips its vehicle with several manufacturers' tires.

The principal objection raised by Bandag should be considerably alleviated by an amendment to Standard No. 109 (36 F.R. 24824) under consideration, which would require tire manufacturers to place the actual tire size, as well as other pertinent information, between the section width and the bead of the tire so that the information will be less susceptible to obliteration during use or removal during the retreading process.

With respect to the comment by Mercedes-Benz of North America and Volkswagen of America, it was concluded that because the existing system does not provide enough symbols to meet the anticipated introduction of new tire sizes, the proposed change is necessary. Mercedes' recommendation that "G", "Q", "S", and "Z" be added or that a three-digit size code be used was rejected, because the additional symbols suggested are difficult to apply to the tire, and the addition of a third symbol would, according to the tire manufacturers, be impractical and inefficient.

A list of the tire size codes assigned up to this time is published in the general notice section of this issue of the *Federal Register* (37 F.R. 23742). The NHTSA urges tire manufacturers to use

**Effective: November 8, 1972**

these existing codes for tire sizes presently being produced and to work within their tire and rim associations to make code assignments for new tire sizes on an industry-wide basis and reuse obsolete size codes wherever possible. In this way the usefulness of the tire size code to the vehicle manufacturer will be maintained.

In consideration of the foregoing, in Part 574 of Title 49, Code of Federal Regulations, Table I is deleted and § 574.5 is amended . . . .

*Effective date:* November 8, 1972.

Because this amendment relieves a restriction, and because of the immediate need for the introduction of new tire size codes, it is found for

good cause shown that an effective date less than 30 days from the date of issuance is in the public interest.

Issued under the authority of sections 103, 112, 113, 119 and 201 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1401, 1402, 1407 and 1421, and the delegation of authority at 49 CFR 1.51.

Issued on October 31, 1972.

Charles H. Hartman  
Acting Administrator

**37 F.R. 23727**  
**November 8, 1972**

**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING****(Docket No. 71-18; Notice 7)**

This notice amends Standard No. 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, to specify lettering sizes and modified treadwear indicator requirements for tires. In addition, it amends Part 574, *Tire Identification*, 49 CFR 574, to permit the labeling of certain tires with the symbol DOT prior to the effective date of the standard. This notice also responds to petitions for reconsideration of Standard 119's effective date by maintaining the present date of March 1, 1975.

To avoid a costly production shutdown on the effective date to engrave tire molds with the DOT compliance symbol required by the standard, the National Highway Traffic Safety Administration (NHTSA) proposed a modification of the Part 574 prohibition on the symbol's use prior to the effective date (39 F.R. 3967, January 31, 1974). The Rubber Manufacturers Association and five tire manufacturers agreed that the DOT should be engraved on tire molds prior to the effective date, but objected to the expense of covering the DOT with a label stating that "no Federal motor vehicle safety standard applies to this tire," when the DOT appears on tires which (presumably) satisfy Standard 119 requirements. Firestone pointed out that the large label size could obscure other label information. Goodrich noted that, as proposed, the DOT could be molded on tires which met no standard and could mislead a user if the label fell off.

The NHTSA will not permit the appearance of the DOT compliance symbol on any item of motor vehicle equipment to which no standard is applicable. The terms "applicability" and "applies" have only one meaning for Federal motor vehicle safety standards: that the vehicle or equipment concerned is subject to a safety standard. To permit use of the DOT symbol on

vehicles or items of motor vehicle equipment to which no standard applies would confuse the meaning of the symbol and the concept of compliance.

In response to Firestone and Goodrich, the NHTSA has modified the lettering size on the label and limited use of the DOT symbol to tires for which a standard has been issued. With the small lettering size, the rubber labels used on retread tires can be applied over the DOT symbol in fulfillment of the requirement. Another method which manufacturers did not mention but which would be permissible is the removal of the DOT at the same time imperfections are buffed off the tire.

All comments on the proposal objected to the specific location requirements for treadwear indicators based on the concept of even tread wear across the tread width. Goodyear demonstrated in a meeting with the NHTSA Tire Division on February 13, 1974, and detailed in its submission to the Docket, the difficulty in equating ideal tire wear with actual road experience. They recommended the simpler concept that a tire has worn out when any major tread groove has only  $\frac{3}{32}$  in tread remaining. The NHTSA has concluded that treadwear indicators must be placed at the discretion of the manufacturer to give a person inspecting the tire visual indication of whether the tire has worn to a certain tread depth. Accordingly, the lateral location requirements for treadwear indicators have been deleted from the standard.

There was no discussion of the lettering size and depth proposal, and these proposals are adopted as proposed.

The comments requested reconsideration of the standard's March 1, 1975, effective date (published February 1, 1974, 39 F.R. 4087), asserting the need for 18 months of lead time following



**Effective: April 3, 1974**

publication of this notice to engrave tire molds as required by the standard. The NHTSA has found that 11 months is sufficient leadtime to accomplish these changes, and accordingly these petitions are denied.

To correct an inadvertent omission in the amendment of Standard No. 119 in response to petitions for reconsideration (39 F.R. 5190, February 11, 1974), superscripts are added to Table III entries for "All other, A, B, C, D range tires".

In consideration of the foregoing, Parts 571 and 574 of Title 49, Code of Federal Regulations, are amended. . . .

*Effective date:* Standard No. 119 amendments: March 1, 1975. Part 574 amendment: April 3,

1974. Because the Part 574 amendment creates no additional burden, and because modification of tire molds must begin immediately, it is found for good cause shown that an effective date less than 180 days after issuance is in the public interest.

(Secs. 103, 112, 119, 201, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on March 28, 1974.

James B. Gregory  
Administrator

**39 F.R. 12104**  
**April 3, 1974**

**PREAMBLE TO AMENDMENT TO PART 574—  
TIRE IDENTIFICATION AND RECORDKEEPING**

**(Docket No. 70-12; Notice 19)**

This notice amends the Tire Identification and Recordkeeping regulation, 49 CFR Part 574, to establish an optional universal registration format for tire registration forms. It also requires manufacturers of new tires to redirect registration forms of other manufacturers of new tires which have been forwarded to them in error.

On March 9, 1973, the NHTSA issued a notice of proposed rulemaking (38 F.R. 6398) proposing a universal registration form for tire identification and record keeping. The notice was issued in response to requests from multi-brand tire dealers who were faced with a multiplicity of different forms and procedures for tire registration. Currently, the regulation merely requires manufacturers and retreaders to supply a "means" of registration. The proposed rule also envisioned that a copy of the form would be provided to the first purchaser and that manufacturers and retreaders would be required to redirect registration forms which had been forwarded to them in error.

All comments received in response to the notice were sympathetic to the problems faced by the multi-brand dealers, and the majority were willing to provide a "universal form" if requested by a dealer.

Most manufacturers, however, pointed out that their exclusive dealerships had received training in the use of the current form, as had their own personnel, and that a total change-over would work a hardship without a concomitant benefit for single-brand dealers. In view of these comments, NHTSA has decided to promulgate the universal registration format, which appears as Fig. 3, as an optional format to be followed if requested by a dealer and as a guide if a dealer prefers to supply his own forms.

The proposal to require tire manufacturers and retreaders to forward all misdirected registration forms within 30 days was universally opposed by new-tire manufacturers, who stated that they are currently participating in a voluntary but limited program for forwarding these misdirected forms. Furthermore, new-tire manufacturers believe they should not be responsible for misdirected retreaded tire registration forms, as there are over 5,000 tire retreaders in the country and such a task would be formidable. One new-tire manufacturer indicated that he had received over 15,000 misdirected retreaded tire registration forms during January 1973. The docket contained only one submission from the retreading industry, and it did not deal with the problem of misdirected forms.

It also appears from the comments received and other information available to NHTSA that new-tire manufacturers maintain a computer-based registration process, while only approximately 25% of the retreading industry utilizes computers for this purpose. Thus, the requirement for forwarding all misdirected forms would fall heavily on both segments of the industry, new-tire manufacturers in that most misdirected forms appear to be sent to them and retreaders in that a majority are ill-equipped to carry out the forwarding functions.

Therefore, rather than issue an all-inclusive forwarding requirement at this time, NHTSA has decided to require only that new-tire manufacturers redirect new tire registration forms erroneously forwarded to them. Further, the NHTSA has determined that a 90-day forwarding period will be sufficient, rather than the 30 days originally proposed. It is expected that the use of the manufacturer's logo on the universal registration format and increased vigilance

on the part of the industry will substantially curtail the number of misdirected forms. If it later appears that tire registrations are not being properly received, the NHTSA intends to take further action in this area.

The notice proposed that tire manufacturers furnish their dealers with duplicate copies of the registration form so that a copy could be given to consumers at the time of purchase. This provision was objected to by all new-tire manufacturers and the retreaders' association. In their view, the increased expense served no viable function as Part 574 currently requires all purchasers to be notified by certified mail of safety defects. They argued that the possession of a duplicate registration form would not aid the purchaser in the case of recall. The manufacturers also said that the completion of registration forms is often reserved until the end of the day or other slack time, and further that the

consumer automatically receives a copy of his tire identification number on the guarantee if one is given.

The NHTSA finds these arguments to have merit, and the requirement to give the purchaser a copy of the registration form is deleted from the final rule.

In consideration of the foregoing, 49 CFR 574.7 is amended....

*Effective date:* September 3, 1974.

(Secs. 103, 112, 113, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on May 28, 1974.

James B. Gregory  
Administrator

**39 F.R. 19482**  
**June 3, 1974**



**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING**

(Docket No. 70-12; Notice 21)

This notice amends 49 CFR Part 574 to provide that the Universal Registration Forms supplied by dealers must conform in size and be similar in format to Figure 3 of the regulation.

On June 2, 1974, 49 CFR Part 574 was amended to require a Universal Registration Format when tire registration forms are supplied by manufacturers to dealers (39 F.R. 19482). Three petitions for reconsideration were received in response to this notice. All three, Michelin Tire Corporation, Rubber Manufacturers Association, and the Firestone Tire and Rubber Company, requested that the regulation be amended to require that dealer-supplied registration forms also conform in size and be similar in format to Figure 3 of the regulation. The petitioners pointed out that registration handling methodology has been standardized throughout the industry, and that the use of different sizes and formats would be costly and inefficient. The NHTSA concurs in this assessment, and therefore amends 49 CFR 574.7(a) to require that the dealer-supplied forms must conform in size and be similar in format to Figure 3.

In addition, Firestone petitioned to revise Figure 3 slightly and to extend the effective date of the amendment to 120 days after the response to the petitions for reconsideration. Since 49 CFR 574.7 currently requires only that the forms be "similar" to Figure 3, Firestone's proposed modification is authorized by the regulation and no amendment to the standard is needed. Firestone's request to extend the effective date of the standard is denied, as NHTSA has determined sufficient lead time was available from the date the amendment was issued to prepare forms.

In consideration of the foregoing, the last sentence of 49 CFR 574.7(a) is amended. . . .

*Effective date:* November 1, 1974.

(Secs. 103, 112, 113, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on October 29, 1974.

James B. Gregory  
Administrator

**39 F.R. 38658**  
**November 1, 1974**



## **PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING**

**(Docket No. 70-12; Notice 22)**

This notice corrects the authority citations to Part 574, *Tire Identification and Recordkeeping*, and makes other small corrections of citations in the text of the regulation to reflect statutory amendments. This correction is being made to conform the statutory authority citations to the existing statute.

**Effective dates:** Since these technical corrections do not affect the responsibilities under the regulation, they are made effective December 26, 1978.

**For further information contact:**

Roger Tilton, Office of Chief Counsel,  
National Highway Traffic Safety Adminis-  
tration, 400 Seventh Street, S.W., Washing-  
ton, D.C. 20590 (202-426-2992).

**Supplementary information:** Since issuance of the Tire Identification and Recordkeeping regulation, several changes have been made to the agency's authorizing statute that require NHTSA to correct the authority citations of the regulation. While authority citations found in NHTSA's regulations and standards are not parts of the rules, they are useful to those who wish to review the legislative background of the rulemaking action. Therefore, NHTSA corrects the authority citations for clarity and to provide information to those who are interested.

The agency also corrects Part 574.2 and 574.8 by altering the existing reference to section 113. Section 113 was the safety defect and noncompliance notification section of the National Traffic

and Motor Vehicle Safety Act of 1966 (Pub. L. 89-563). Section 102 of the 1974 Motor Vehicle and Schoolbus Safety Amendments (Pub. L. 93-492) transferred the notification provisions from section 113 to section 151 and 152 of the Safety Act, as amended (15 U.S.C. 1411 and 1412). Since the regulation currently refers to the old Act rather than the Act as amended, the agency is correcting the affected provisions of the regulation to bring them up to date.

Since this notice simply corrects references in the regulation and its authority citations without altering any of its substantive provisions, the Administrator finds that notice is unnecessary and that an immediate effective date is in the public interest.

In consideration of the foregoing, Volume 49 of the Code of Federal Regulations, Part 574, *Tire Identification and Recordkeeping*, is amended. . . .

(Secs. 103, 108, 112, 119, 201, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1397, 1401, 1407, 1421); Secs. 102, 103, 104, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1397, 1401, 1411-1420); delegation of authority at 49 CFR 1.50).

Issued on December 18, 1978.

Joan Claybrook  
Administrator

**43 F.R. 60171  
December 26, 1978**





## PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice 23)

*Action:* Amendment of rule.

*Summary:* Congress has recently amended the National Traffic and Motor Vehicle Safety Act of 1966 (the Safety Act) to exempt manufacturers of retreaded tires from the registration requirements of the Act. This notice makes conforming amendments to the regulations implementing the tire registration requirements of the Act. The amendment is being published as a final rule without notice and opportunity for comment and is effective immediately, rather than 180 days after issuance, since the agency lacks discretion on the manner implementing this Congressional mandate.

*Effective date:* February 8, 1979.

*For further information contact:*

Arturo Casanova, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-1715.

*Supplementary information:* Congress has recently enacted the Surface Transportation Assistance Act of 1978, P.L. 95-599. Section 317 of that Act amends the Safety Act by exempting manufacturers of retreaded tires from the registration requirements of section 158(b) of the Safety Act.

This amendment modifies the requirements of Part 574 to specify that manufacturers of retreaded tires are not subject to the mandatory registration requirements set forth in that Part. Manufacturers of retreaded tires are free to continue voluntarily registering the tires, and the agency encourages these manufacturers to provide some means for notifying purchasers in the event of a recall of tires that do not comply with

federal safety standards or contain a safety-related defect. However, this choice will be left to the individual retreaders.

The remaining obligations of retreaders under Part 574 are set forth in §§ 574.5 and 574.6, which provisions are not affected by this amendment. Those sections require that the retreader label contain certain information on its tires. These provisions allow a retreader who determines that some of its tires do not comply with a Federal safety standard or contain a safety-related defect to warn the public of that fact, and indicate the label numbers of the affected tires.

Since Congress has amended the Safety Act to exempt the manufacturers of retreaded tires from the registration requirements, this amendment of Part 574 is published without notice and opportunity for comment. The Administrator finds good cause for foregoing these procedures in this instance, because Congress has specifically mandated this action, and the agency has no authority to disregard a legislative mandate. For the same reason, this amendment is effective immediately, rather than 180 days after issuance.

The agency has reviewed the impacts of this amendment and determined that they will reduce costs to the manufacturers. Further, the agency has determined that the amendment is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this amendment are Arturo Casanova and Stephen Kratzke, respectively.

In consideration of the foregoing, 49 CFR Part 574, Tire Identification and Recordkeeping, is amended . . . .

AUTHORITY: Sections 103, 108, 112, 119, 201, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1397, 1401, 1407, 1421); secs. 102, 103, 104, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1411-1420); Stat. 2689 (15 U.S.C. 1418); delegation of authority at 49 CFR 1.51.

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Issued on January 31, 1979.

Joan Claybrook  
Administrator

**44 F.R. 7963**  
**February 8, 1979**



## PART 574—TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice No. 5)

Sec.

- 574.1 Scope.**
- 574.2 Purpose.**
- 574.3 Definitions.**
- 574.4 Applicability.**
- 574.5 Tire identification requirements.**
- 574.6 Identification mark.**
- 574.7 Information requirements—tire manufacturers, brand name owners, retreaders.**
- 574.8 Information requirements—tire distributors and dealers.**
- 574.9 Requirements for motor vehicle dealers.**
- 574.10 Requirements for motor vehicle manufacturers.**

**AUTHORITY:** The provisions of this Part 574 issued under secs. 103, 112, 113, 119, 201, and 206, National Traffic and Motor Vehicle Safety Act of 1966, as amended, 15 U.S.C. 1392, 1401, 1402, 1407, 1421, and 1426; delegation of authority at 49 CFR 1.51, 35 F.R. 4955.

### § 574.1 Scope.

This part sets forth the method by which manufacturers, brand name owners, and retreaders shall identify tires for use on motor vehicles and maintain records of tire purchasers, and the method by which distributors and dealers of new and retreaded tires shall record and report the names of tire purchasers to manufacturers, brand name owners and retreaders.

### § 574.2 Purpose.

The purpose of this part is to facilitate notification to purchasers of defective or nonconforming tires, pursuant to sections 151 and 152 of the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1411 and 1412). (hereafter the Act), so that they may take appropriate action in the interest of motor vehicle safety.

### § 574.3 Definitions.

(a) *Statutory definitions.* All terms in this part that are defined in section 102 of the Act are used as defined therein.

(b) *Motor vehicle safety standard definitions.* Unless otherwise indicated, all terms used in this part that are defined in the Motor Vehicle Safety Standards, part 571 of this subchapter (hereinafter the Standards), are used as defined therein.

(c) *Definitions used in this part.* (1) "Mileage contract purchaser" means a person who purchases or leases tire use on a mileage basis.

(2) "Tire brand name owner" means a person, other than a tire manufacturer, who owns or has the right to control the brand name of a tire or a person who licenses another to purchase tires from a tire manufacturer bearing the licensor's brand name.

(3) "Tire purchaser" means a person who buys or leases a new or newly retreaded tire, or who buys or leases for 60 days or more a motor vehicle containing a new tire or a newly retreaded tire, for purposes other than resale.

### § 574.4 Applicability.

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948. However, it does not apply to persons who retread tires solely for their own use.

### § 574.5 Tire identification requirements.

Each tire manufacturer shall conspicuously label on one sidewall of each tire he manufactures, except tires manufactured exclusively for mileage contract purchasers, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number containing the information set forth in paragraphs (a) through (d) of this

section. Each tire retreader, except tire retreaders who retread tires for their own use, shall conspicuously label one sidewall of each tire he retreads by permanently molding or branding into or onto the sidewall, in the manner and location specified in Figure 2, a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by Federal Motor Vehicle Safety Standards shall be located as shown in Figures 1 and 2. The DOT symbol shall not appear on tires to which no Federal Motor Vehicle Safety Standard is applicable, unless, in the case of tires for which a standard has been issued but which is not yet effective, the symbol is covered by a label that is not easily removable and that states in letters at least 0.078 inches high:

NO FEDERAL MOTOR  
VEHICLE SAFETY  
STANDARD APPLIES  
TO THIS TIRE

The symbols to be used in the tire identification number for tire manufacturers and retreaders are "A, B, C, D, E, F, H, J, K, L, M, N, P, R, T, U, V, W, X, Y, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0." Tires manufactured or retreaded exclusively for mileage contract purchasers are not required to contain the tire identification number if the tire contains the phrase "for mileage contract use only" permanently molded into or onto the tire sidewall in lettering at least one-quarter inch high.

(a) First grouping. The first group, of two or three symbols, depending on whether the tire is new or retreaded, shall represent the manufacturer's assigned identification mark (see § 574.6).

(b) Second grouping. For new tires, the second group, of no more than two symbols, shall be used to identify the tire size. For retreaded tires, the second group, of no more than two symbols, shall identify the retread matrix in which the tire was processed or a tire size code if a matrix was not used to process the retreaded tire. Each new tire manufacturer and retreader shall maintain a record of each symbol used, with the corresponding matrix or tire size and shall provide such record to NHTSA upon written request.

(c) Third grouping. The third group, consisting of no more than four symbols, may be used at the option of the manufacturer or retreader as a descriptive code for the purpose of identifying significant characteristics of the tire. However, if the tire is manufactured for a brand name owner, one of the functions of the third grouping shall be to identify the brand name owner. Each manufacturer or retreader who uses the third grouping shall maintain a detailed record of any descriptive or brand name owner code used, which shall be provided to the Bureau upon written request.

(d) Fourth grouping. The fourth group, of three symbols, shall identify the week and year of manufacture. The first two symbols shall identify the week of the year using "01" for the first full calendar week in each year. The final week of each year may include not more than 6 days of the following year. The third symbol shall identify the year. (Example: 311 means the 31st week of 1971, or Aug. 1 through 7, 1971; 012 means the first week of 1972, or Jan. 2 through 8, 1972.) The symbols signifying the date of manufacture shall immediately follow the optional descriptive code (paragraph (c) of this section). If no optional descriptive code is used the symbols signifying the date of manufacture shall be placed in the area shown in Figures 1 and 2 for the optional descriptive code.

#### § 574.6 Identification mark.

To obtain the identification mark required by § 574.5(a), each manufacturer of new or retreaded motor vehicle tires shall apply after November 30, 1970, in writing to Tire Identification and Recordkeeping, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, D.C. 20590, identify himself as a manufacturer of new tires or retreaded tires, and furnish the following information:

(a) The name, or other designation identifying the applicant, and his main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., passenger car tires, bus tires, truck tires, motorcycle tires, or retreaded tires.



**§ 574.7 Information requirements—tire manufacturers, brand name owners, retreaders.**

(a) Each tire manufacturer, brand name owner and retreader (hereinafter referred to in this section and § 574.8 as "tire manufacturer" unless specified otherwise), or his designee, shall provide forms to every distributor and dealer of his tires who offers these tires for sale or lease to tire purchasers, by which the distributor or dealer may record the information appearing in paragraphs (a)(1), (a)(2) and (a)(3) of this section. Forms conforming in size and similar in format to Figure 3 shall be provided to those dealers who request them, or if a dealer prefers, he may supply his own form as long as it contains the required information, conforms in size, and is similar in format to Figure 3.

(1) Name and address of the tire purchaser;

(2) Tire identification number;

(3) Name and address of the tire seller or other means by which the manufacturer can identify the tire seller.

(b) Each tire manufacturer shall record and maintain or have recorded and maintained for him, the information specified in paragraph (a) of this section and shall not use this information for any commercial purpose detrimental to tire distributors or dealers. Any new-tire manufacturer to whom forms are mistakenly returned shall forward the new-tire registration forms to the proper new-tire manufacturer within 90 days from receipt of the form.

(c) Each tire manufacturer shall maintain, or have maintained for him, a record of each tire distributor or dealer who purchases tires directly from him and sells them to tire purchasers, the number of tires purchased by each such distributor or dealer, the number of tires for which

**Notes:**

1. Tire identification number shall be in Futura Bold, Modified Condensed or Gothic characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area.
4. Other print type will be permitted if approved by the administration.

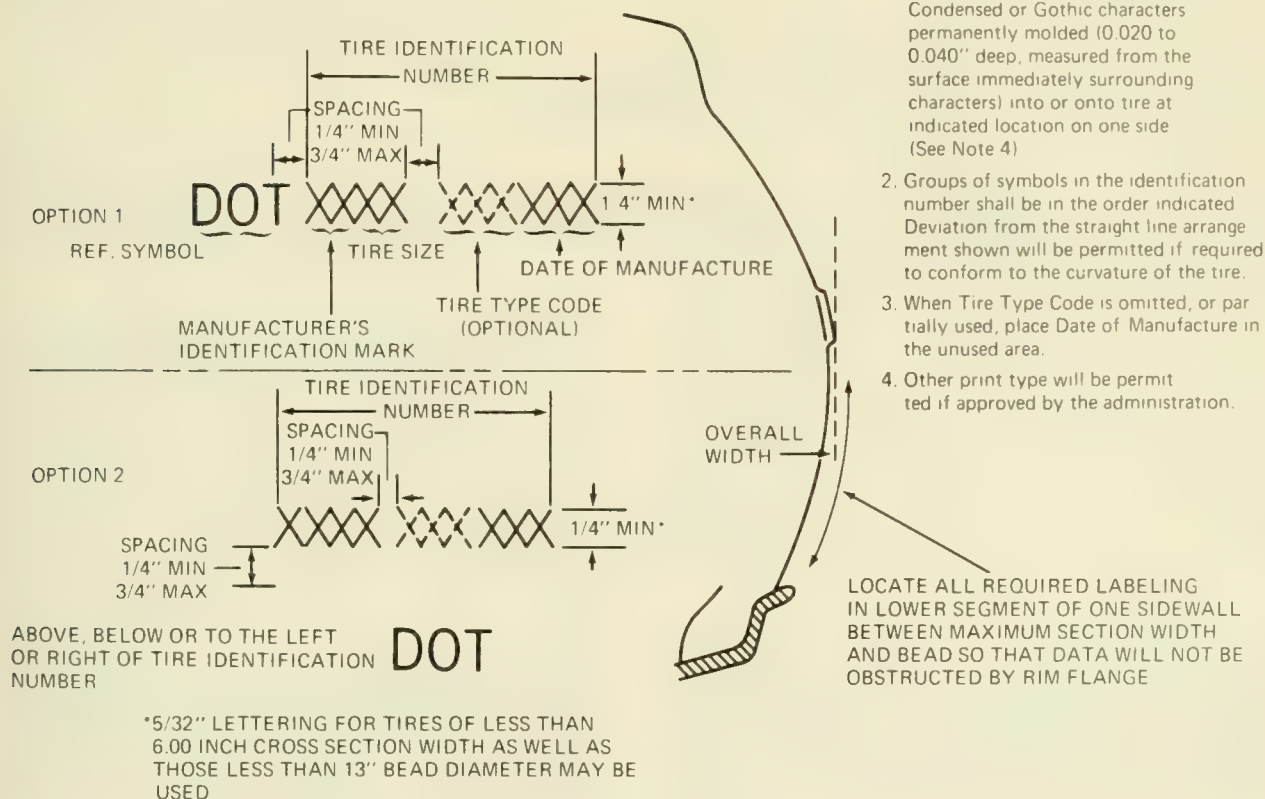
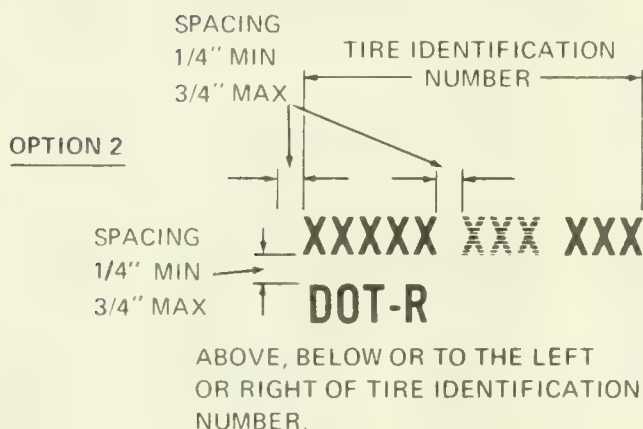
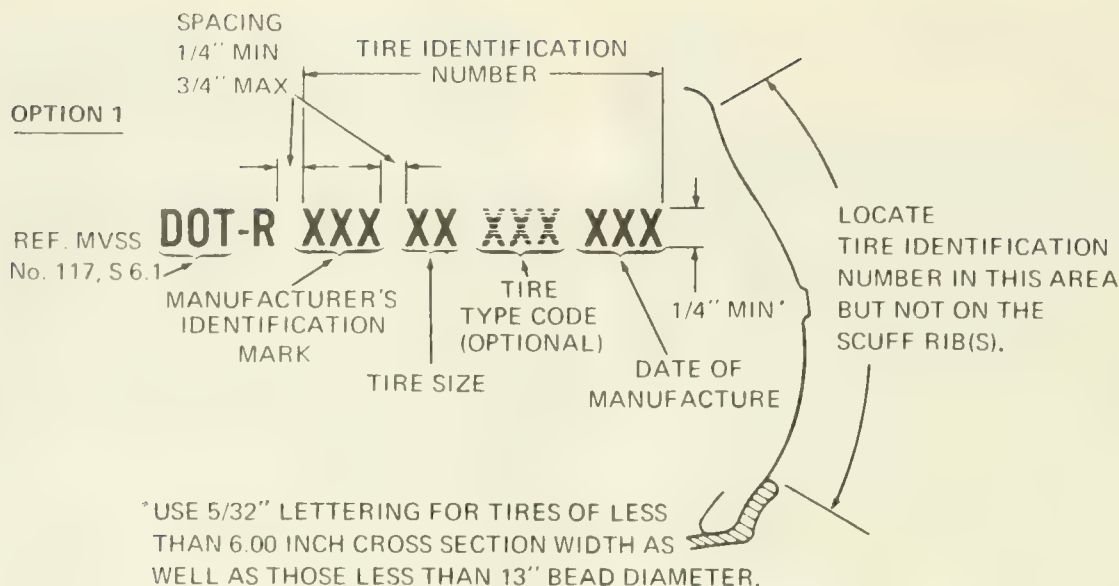


FIGURE 1 - IDENTIFICATION NUMBER FOR NEW TIRES





**NOTES:**

1. Tire identification number shall be in "Futura Bold, Modified, Condensed or Gothic" characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side. (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area.
4. Other print type will be permitted if approved by the Administration.

FIGURE 2 IDENTIFICATION NUMBER FOR RETREADED TIRES

reports have been received from each such distributor or dealer pursuant to paragraph (a) of § 574.8, the total number of tires sold by the tire manufacturer, and the total number of tires for which reports have been received.

(d) Information required by paragraph (a) of this section shall be maintained for a period of not less than 3 years from the date the tire manufacturer or his designee records the information submitted to him.

7 3/8" ± 1/8"

3 1/4" ± 1/8"

**IMPORTANT: FEDERAL LAW REQUIRES  
TIRE IDENTIFICATION NUMBERS MUST  
BE REGISTERED**

(PLEASE PRINT)

CUSTOMER'S NAME \_\_\_\_\_ RETURN TO \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_ ZIP \_\_\_\_

DATE [ ][ ] FLEET VEHICLE No (OPTIONAL) \_\_\_\_\_

SELLERS NAME AND OR MANUFACTURER SELLER NUMBER \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_ ZIP \_\_\_\_

①                  ②

☐ NEW      ☐ RETREAD

QTY	TIRE IDENTIFICATION NUMBERS											
	1	2	3	4	5	6	7	8	9	10	11	12

① PREPRINTED TIRE MANUFACTURERS'  
LOGO OR OTHER IDENTIFICATION  
AND MAILING ADDRESS

② MICROFILM NUMBER  
LOCATION IF NECESSARY

A-B AREAS TO SUIT TIRE  
MANUFACTURERS  
REQUIREMENTS

part, to be a tire dealer and shall meet the requirements specified in § 574.8.

(b) Each person selling a new motor vehicle to first purchasers for purposes other than resale, that is equipped with tires that were not on the motor vehicle when shipped by the vehicle manufacturer is considered a tire dealer for purposes of this part and shall meet the requirements specified in § 574.8.

**§ 574.10 Requirements for motor vehicle manufacturers.**

Each motor vehicle manufacturer, or his designee, shall maintain a record of tires on or in each vehicle shipped by him to a motor vehicle distributor or dealer, and shall maintain a record of the name and address of the first purchaser for purposes other than resale of each vehicle equipped with such tires. These records shall be maintained for a period of not less than 3 years from the date of sale of the vehicle to the first purchaser for purposes other than resale.

**INTERPRETATION**

Under section 113(f) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402 (f)) and Part 574, it is the tire manufacturer who has the ultimate responsibility for

maintaining the records of first purchasers. Therefore, it is the tire manufacturer or his designee who must maintain these records. The term "designee," as used in the regulation, was not intended to preclude multiple designees; if the tire manufacturer desires, he may designate more than one person to maintain the required information. Furthermore, neither the Act nor the regulation prohibits the distributor or dealer from being the manufacturer's designee, nor do they prohibit a distributor or dealer from selecting someone to be the manufacturer's designee provided the manufacturer approves of the selection.

With respect to the possibility of manufacturers using the maintained information to the detriment of a distributor or dealer, NHTSA will of course investigate claims by distributors or dealers of alleged misconduct and, if the maintained information is being misused, take appropriate action.

**36 F.R. 4783  
March 12, 1971**

**36 F.R. 13757  
July 24, 1971**

**36 F.R. 16510  
August 21, 1971**



## PREAMBLE TO TIRE CODE MARKS ASSIGNED TO NEW TIRE MANUFACTURERS

The purpose of this notice is to publish the code numbers assigned to new-tire manufacturers under the Tire Identification and Recordkeeping Regulation, 49 CFR Part 574 (36 F.R. 1196).

The Tire Identification and Recordkeeping Regulation (hereafter Part 574) requires that new tires manufactured after May 22, 1971, be marked with a two-symbol manufacturer's code, and that retreaded tires be marked with a three-symbol manufacturer's code. The manufacturer's code is the first grouping within the tire identification number (after the symbol "DOT" or "R" where required).

Under Part 574 a separate code number is assigned to each manufacturer's plant. Table 1 of the notice lists the code numbers assigned and the manufacturer that received each code number. Table 2 lists the same information by

manufacturer. Codes assigned to retreaders will be available for inspection in the Docket Section, Room 5217, 400 Seventh Street SW., Washington, D.C. 20590.

The codes assigned to new-tire manufacturers replace the three-digit code numbers required on new brand-name passenger car tires manufactured prior to May 22, 1971, under Standard No. 109. (The list of numbers assigned under Standard No. 109 was published in the *Federal Register* of July 2, 1968, 34 F.R. 11158.)

Issued on April 14, 1971.

Rodolfo A. Diaz,  
Acting Associate Administrator,  
Motor Vehicle Programs.

**36 F.R. 7539**  
**April 21, 1971**



## **PREAMBLE TO TIRE SIZE CODES**

The purpose of this notice is to publish an updated list of tire size codes assigned by the National Highway Traffic Safety Administration in accordance with the Tire Identification and Record Keeping regulation, 49 CFR Part 574 (36 F.R. 1196).

The Tire Identification and Record Keeping regulation requires that a tire identification number be placed on new and retreaded tires, and that the second grouping of the number be a code that identifies the tire size or, in the case of a retreaded tire, the tire matrix. New tire manufacturers have up to now been required to use a specific tire size code assigned to the tire size by the NHTSA. Because of the number of new tire sizes being introduced into the market, the possible combinations of letters and numbers have been virtually exhausted.

In order to accommodate new tire sizes the regulation is being amended by notice published elsewhere in this issue (37 F.R. 23727), to allow each tire manufacturer to assign a two-symbol

size code of his own choice, rather than having the number assigned by the agency. However, it is urged that manufacturers maintain the assigned tire size code for existing tire sizes, and that they reuse obsolete tire size codes for new sizes wherever possible.

For convenience of reference, an updated list of the tire size codes assigned by the NHTSA is published below for the information and guidance of tire manufacturers.

This notice is issued under the authority of sections 103, 113, 119, 201 and 1402, 1407, 1421 and 1426; and the delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.

Issued on October 26, 1972.

Robert L. Carter  
Associate Administrator  
Motor Vehicle Programs

**38 F.R. 23742**

**November 8, 1972**





**TABLE 1. LIST OF ALPHA-NUMERIC CODE ASSIGNMENTS TO NEW TIRE MANUFACTURERS**  
**(Based on the following Alpha-numeric code with letters: ABCDEFHJKLMNPTUVWXY**  
**and Nos. 123456789)**

<i>Code No.</i>	<i>New Tire Manufacturers</i>	<i>Code No.</i>	<i>New Tire Manufacturers</i>
AA	The General Tire Co.	DP	The Dunlop Tire & Rubber Corp. (England).
AB	The General Tire Co.	DT	The Dunlop Tire & Rubber Corp. (Australia).
AC	The General Tire Co.	DU	The Dunlop Tire & Rubber Corp. (Australia).
AD	The General Tire Co.	DV	Vredestein (The Netherlands).
AE	The General Tire Co. (Spain).	DW	Vredestein (The Netherlands).
AF	The General Tire Co. (Portugal).	DX	Vredestein Radium (The Netherlands).
AH	The General Tire Co. (Mexico).	DY	Denman Rubber Manufacturing Co.
AJ	Uniroyal, Inc.	EA	Metzeler A.G. (Germany).
AK	Uniroyal, Inc.	EB	Metzeler A.G. (Germany).
AL	Uniroyal, Inc.	EC	Metzeler A.G. (Germany).
AM	Uniroyal, Inc.	ED	Okamoto Riken Gomu Co., Ltd. (Japan).
AN	Uniroyal, Inc.	EE	Nitto Tire Co., Ltd. (Japan).
AP	Uniroyal, Inc.	EF	Hung Ah Tire Co., Ltd. (Korea).
AT	Avon Rubber Co. (England).	EH	Bridgestone Tire Co., Ltd. (Japan).
AU	Uniroyal, Ltd. (Canada).	EJ	Bridgestone Tire Co., Ltd. (Japan).
AV	The Sieberling Tire & Rubber Co.	EK	Bridgestone Tire Co., Ltd. (Japan).
AW	Samson Tire & Rubber Co., Ltd. (Israel).	EL	Bridgestone Tire Co., Ltd. (Japan).
AX	Phoenix Gummiwerke A.G. (Germany).	EM	Bridgestone Tire Co., Ltd. (Japan).
AY	Phoenix Gummiwerke A.G. (Germany).	EN	Bridgestone Tire Co., Ltd. (Japan).
BA	The B. F. Goodrich Co.	EP	Bridgestone Tire Co., Ltd. (Japan).
BB	The B. F. Goodrich Co.	ET	Sumitomo Rubber Industries, Ltd. (Japan).
BC	The B. F. Goodrich Co.	EU	Sumitomo Rubber Industries, Ltd. (Japan).
BD	The B. F. Goodrich Co.	EV	Kleber-Colombes Co. (France).
BE	The B. F. Goodrich Co.	EW	Kleber-Colombes Co. (France).
BF	The B. F. Goodrich Co.	EX	Kleber-Colombes Co. (France).
BH	The B. F. Goodrich Co. (Canada).	EY	Kleber-Colombes Co. (France).
BJ	The B. F. Goodrich Co. (Germany).	FA	The Yokohama Rubber Co., Ltd. (Japan).
BK	The B. F. Goodrich Co. (Brazil).	FB	The Yokohama Rubber Co., Ltd. (Japan).
BL	The B. F. Goodrich Co. (Colombia).	FC	The Yokohama Rubber Co., Ltd. (Japan).
BM	The B. F. Goodrich Co. (Australia).	FD	The Yokohama Rubber Co., Ltd. (Japan).
BN	The B. F. Goodrich Co. (Philippines).	FE	The Yokohama Rubber Co., Ltd. (Japan).
BP	The B. F. Goodrich Co. (Iran).	FF	Michelin Tire Corp. (France).
BT	Semperit Gummiwerke A.G. (Austria).	FH	Michelin Tire Corp. (France).
BU	Semperit Gummiwerke A.G. (Ireland).	FJ	Michelin Tire Corp. (France).
BV	IRI International Rubber Co.	FK	Michelin Tire Corp. (France).
BW	The Gates Rubber Co.	FL	Michelin Tire Corp. (France).
BX	The Gates Rubber Co.	FM	Michelin Tire Corp. (France).
BY	The Gates Rubber Co.	FN	Michelin Tire Corp. (France).
CA	The Mohawk Rubber Co.	FP	Michelin Tire Corp. (Algeria).
CB	The Mohawk Rubber Co.	FT	Michelin Tire Corp. (Germany).
CC	The Mohawk Rubber Co.	FU	Michelin Tire Corp. (Germany).
CD	Alliance Tire & Rubber Co., Ltd. (Israel).	FV	Michelin Tire Corp. (Germany).
CE	The Armstrong Rubber Co.	FW	Michelin Tire Corp. (Germany).
CF	The Armstrong Rubber Co.	FX	Michelin Tire Corp. (Belgium).
CH	The Armstrong Rubber Co.	FY	Michelin Tire Corp. (The Netherlands).
CJ	Inoue Rubber Co., Ltd. (Japan).	HA	Michelin Tire Corp. (Spain).
CK	Not assigned.	HB	Michelin Tire Corp. (Spain).
CL	Not assigned.	HC	Michelin Tire Corp. (Spain).
CM	Continental Gummiwerke A.G. (Germany).	HD	Michelin Tire Corp. (Italy).
CN	Continental Gummiwerke A.G. (France).	HE	Michelin Tire Corp. (Italy).
CP	Continental Gummiwerke A.G. (Germany).	HF	Michelin Tire Corp. (Italy).
CT	Continental Gummiwerke A.G. (Germany).	HH	Michelin Tire Corp. (Italy).
CU	Continental Gummiwerke A.G. (Germany).	HJ	Michelin Tire Corp. (United Kingdom).
CV	The Armstrong Rubber Co.	HK	Michelin Tire Corp. (United Kingdom).
CW	The Toyo Rubber Industry Co., Ltd. (Japan).	HL	Michelin Tire Corp. (United Kingdom).
CX	The Toyo Rubber Industry Co., Ltd. (Japan).	HM	Michelin Tire Corp. (United Kingdom).
CY	McCreary Tire & Rubber Co.	HN	Michelin Tire Corp. (Canada).
DA	The Dunlop Tire & Rubber Corp.	HP	Michelin Tire Corp. (South Vietnam).
DB	The Dunlop Tire & Rubber Corp.	HT	CEAT (Italy).
DC	The Dunlop Tire & Rubber Corp. (Canada).	HU	CEAT (Italy).
DD	The Dunlop Tire & Rubber Corp. (England).	HV	CEAT (Italy).
DE	The Dunlop Tire & Rubber Corp. (England).	HW	Withdrawn.
DF	The Dunlop Tire & Rubber Corp. (England).	HX	The Dayton Tire & Rubber Co.
DH	The Dunlop Tire & Rubber Corp. (Scotland).	HY	The Dayton Tire & Rubber Co.
DJ	The Dunlop Tire & Rubber Corp. (France).	JA	The Lee Tire & Rubber Co.
DK	The Dunlop Tire & Rubber Corp. (France).	JB	The Lee Tire & Rubber Co.
DL	The Dunlop Tire & Rubber Corp. (France).	JC	The Lee Tire & Rubber Co.
DM	The Dunlop Tire & Rubber Corp. (Germany).	JD	The Lee Tire & Rubber Co.
DN	The Dunlop Tire & Rubber Corp. (Germany).		

<i>Code No.</i>	<i>New Tire Manufacturers</i>	<i>Code No.</i>	<i>New Tire Manufacturers</i>
JE	The Lee Tire & Rubber Co.	NA	The Goodyear Tire & Rubber Co. (Republic of Congo).
JF	The Lee Tire & Rubber Co.	NB	The Goodyear Tire & Rubber Co. (England).
JH	The Lee Tire & Rubber Co.	NC	The Goodyear Tire & Rubber Co. (France).
JJ	The Lee Tire & Rubber Co.	ND	The Goodyear Tire & Rubber Co. (Germany).
JK	The Lee Tire & Rubber Co.	NE	The Goodyear Tire & Rubber Co. (Germany).
JL	The Lee Tire & Rubber Co.	NF	The Goodyear Tire & Rubber Co. (Greece).
JM	The Lee Tire & Rubber Co.	NH	The Goodyear Tire & Rubber Co.
JN	The Lee Tire & Rubber Co.	NJ	The Goodyear Tire & Rubber Co. (Luxembourg).
JP	The Lee Tire & Rubber Co.	NK	The Goodyear Tire & Rubber Co. (India.)
JT	The Lee Tire & Rubber Co.	NL	The Goodyear Tire & Rubber Co. (Indonesia).
JU	The Lee Tire & Rubber Co. (Canada).	NM	The Goodyear Tire & Rubber Co. (Italy).
JV	The Lee Tire & Rubber Co. (Canada).	NN	The Goodyear Tire & Rubber Co. (Jamaica).
JW	The Lee Tire & Rubber Co. (Canada).	NP	The Goodyear Tire & Rubber Co. (Mexico).
JX	Lee Tire & Rubber Co. (Canada).	NT	The Goodyear Tire & Rubber Co. (Peru).
JY	Lee Tire & Rubber Co. (Argentina).	NU	The Goodyear Tire & Rubber Co. (Philippines).
KA	Lee Tire & Rubber Co. (Australia).	NV	The Goodyear Tire & Rubber Co. (Scotland).
KB	Lee Tire & Rubber Co. (Australia).	NW	The Goodyear Tire & Rubber Co. (South Africa).
KC	Lee Tire & Rubber Co. (Brazil).	NX	The Goodyear Tire & Rubber Co. (Sweden).
KD	Lee Tire & Rubber Co. (Columbia).	NY	The Goodyear Tire & Rubber Co. (Thailand).
KE	Lee Tire & Rubber Co. (Republic of Congo).	PA	The Goodyear Tire & Rubber Co. (Turkey).
KF	Lee Tire & Rubber Co. (France).	PB	The Goodyear Tire & Rubber Co. (Venezuela).
KH	Lee Tire & Rubber Co. (Germany).	PC	The Goodyear Tire & Rubber Co. (Canada).
KJ	Lee Tire & Rubber Co. (Germany).	PD	The Goodyear Tire & Rubber Co. (Canada).
KK	Lee Tire & Rubber Co. (Greece).	PE	The Goodyear Tire & Rubber Co. (Canada).
KL	Lee Tire & Rubber Co. (Guatemala).	PF	The Goodyear Tire & Rubber Co. (Canada).
KM	Lee Tire & Rubber Co. (Luxembourg).	PH	The Kelly-Springfield Tire Co.
KN	Lee Tire & Rubber Co. (India).	PJ	The Kelly-Springfield Tire Co.
KP	Lee Tire & Rubber Co. (Indonesia).	PK	The Kelly-Springfield Tire Co.
KT	Lee Tire & Rubber Co. (Italy).	PL	The Kelly-Springfield Tire Co.
KU	Lee Tire & Rubber Co. (Jamaica).	PM	The Kelly-Springfield Tire Co.
KV	Lee Tire & Rubber Co. (Mexico).	PN	The Kelly-Springfield Tire Co.
KW	Lee Tire & Rubber Co. (Peru).	PP	The Kelly-Springfield Tire Co.
KX	Lee Tire & Rubber Co. (Philippines).	PT	The Kelly-Springfield Tire Co.
KY	Lee Tire & Rubber Co. (Scotland).	PU	The Kelly-Springfield Tire Co.
LA	Lee Tire & Rubber Co. (South Africa).	PV	The Kelly-Springfield Tire Co.
LB	Lee Tire & Rubber Co. (Sweden).	PW	The Kelly-Springfield Tire Co.
LC	Lee Tire & Rubber Co. (Thailand).	PX	The Kelly-Springfield Tire Co.
LD	Lee Tire & Rubber Co. (Turkey.)	PY	The Kelly-Springfield Tire Co.
LE	Lee Tire & Rubber Co. (Venezuela.)	TA	The Kelly-Springfield Tire Co.
LF	Lee Tire & Rubber Co. (England).	TB	The Kelly-Springfield Tire Co. (Argentina).
LH	Uniroyal, Inc. (Australia).	TC	The Kelly-Springfield Tire Co. (Australia).
LJ	Uniroyal, Inc. (Belgium).	TD	The Kelly-Springfield Tire Co. (Australia).
LK	Uniroyal, Inc. (Columbia).	TE	The Kelly-Springfield Tire Co. (Brazil).
LL	Uniroyal, Inc. (France).	TF	The Kelly-Springfield Tire Co. (Columbia).
LM	Uniroyal, Inc. (Germany).	TH	The Kelly-Springfield Tire Co. (Republic of Congo).
LN	Uniroyal, Inc. (Mexico).	TJ	The Kelly-Springfield Tire Co. (England).
LP	Uniroyal, Inc. (Scotland).	TK	The Kelly-Springfield Tire Co. (France).
LT	Uniroyal, Inc. (Turkey).	TL	The Kelly-Springfield Tire Co. (Germany).
LU	Uniroyal, Inc. (Venezuela).	TM	The Kelly-Springfield Tire Co. (Germany).
LV	Mansfield-Denman-General Co., Ltd. (Canada).	TN	The Kelly-Springfield Tire Co. (Greece).
LW	Trelleborg Rubber Co., Inc. (Sweden).	TP	The Kelly-Springfield Tire Co. (Guatemala).
LX	Mitsuboshi Belting, Ltd. (Japan).	TT	The Kelly-Springfield Tire Co. (Luxembourg).
LY	Mitsuboshi Belting, Ltd. (Japan).	TU	The Kelly-Springfield Tire Co. (India).
MA	The Goodyear Tire & Rubber Co.	TV	The Kelly-Springfield Tire Co. (Indonesia).
MB	The Goodyear Tire & Rubber Co.	TW	The Kelly-Springfield Tire Co. (Italy).
MC	The Goodyear Tire & Rubber Co.	TX	The Kelly-Springfield Tire Co. (Jamaica).
MD	The Goodyear Tire & Rubber Co.	TY	The Kelly-Springfield Tire Co. (Mexico).
ME	The Goodyear Tire & Rubber Co.	UA	The Kelly-Springfield Tire Co. (Peru).
MF	The Goodyear Tire & Rubber Co.	UB	The Kelly-Springfield Tire Co. (Philippines).
MH	The Goodyear Tire & Rubber Co.	UC	The Kelly-Springfield Tire Co. (Scotland).
MJ	The Goodyear Tire & Rubber Co.	UD	The Kelly-Springfield Tire Co. (South Africa).
MK	The Goodyear Tire & Rubber Co.	UE	The Kelly-Springfield Tire Co. (Sweden).
ML	The Goodyear Tire & Rubber Co.	UF	The Kelly-Springfield Tire Co. (Thailand).
MM	The Goodyear Tire & Rubber Co.	UH	The Kelly-Springfield Tire Co. (Turkey).
MN	The Goodyear Tire & Rubber Co.	UJ	The Kelly-Springfield Tire Co. (Venezuela).
MP	The Goodyear Tire & Rubber Co.	UK	The Kelly-Springfield Tire Co. (Canada).
MT	The Goodyear Tire & Rubber Co.	UL	The Kelly-Springfield Tire Co. (Canada).
MU	The Goodyear Tire & Rubber Co. (Argentina)	UM	The Kelly-Springfield Tire Co. (Canada).
MV	The Goodyear Tire & Rubber Co., (Australia)	UN	The Kelly-Springfield Tire Co. (Canada).
MW	The Goodyear Tire & Rubber Co. (Australia).	UP	Copper Tire & Rubber Co.
MX	The Goodyear Tire & Rubber Co. (Brazil).		
MY	The Goodyear Tire & Rubber Co. (Colombia).		



<i>Code No.</i>	<i>New Tire Manufacturers</i>
UT .....	Copper Tire & Rubber Co.
UU .....	Carlisle Tire & Rubber Division of Carlisle Corp.
UV .....	Kyowa Rubber Industry Co., Ltd. (Japan).
UW .....	Not assigned.
UX .....	Not assigned.
UY .....	Not assigned.
VA .....	The Firestone Tire & Rubber Co.
VB .....	The Firestone Tire & Rubber Co.
VC .....	The Firestone Tire & Rubber Co.
VD .....	The Firestone Tire & Rubber Co.
VE .....	The Firestone Tire & Rubber Co.
VF .....	The Firestone Tire & Rubber Co.
VH .....	The Firestone Tire & Rubber Co.
VJ .....	The Firestone Tire & Rubber Co.
VK .....	The Firestone Tire & Rubber Co.
VL .....	The Firestone Tire & Rubber Co. (Canada).
VM .....	The Firestone Tire & Rubber Co. (Canada).
VN .....	The Firestone Tire & Rubber Co. (Canada).
VP .....	The Firestone Tire & Rubber Co. (Italy).
VT .....	The Firestone Tire & Rubber Co. (Spain).
VU .....	Withdrawn.
VV .....	The Firestone Tire & Rubber Co. (Sweden).
VW .....	The Firestone Tire & Rubber Co. (Japan).
VX .....	The Firestone Tire & Rubber Co. (England).
VY .....	The Firestone Tire & Rubber Co. (Wales).
WA .....	The Firestone Tire & Rubber Co. (France).
WB .....	The Firestone Tire & Rubber Co. (Costa Rica).
WC .....	The Firestone Tire & Rubber Co. (Australia).
WD .....	The Firestone Tire & Rubber Co. (Switzerland).

<i>Code No.</i>	<i>New Tire Manufacturers</i>
WE .....	Withdrawn.
WF .....	The Firestone Tire & Rubber Co. (Spain).
WH .....	The Firestone Tire & Rubber Co. (Sweden).
WJ .....	The Firestone Tire & Rubber Co. (Australia).
WK .....	Pennsylvania Tire & Rubber Company of Mississippi.
WL .....	The Mansfield Tire & Rubber Co.
WM .....	Olympic Tire & Rubber Co. Pty., Ltd. (Australia).
WN .....	Olympic Tire & Rubber Co Pty., Ltd. (Australia).
WP .....	Schenuit Industries, Inc.
WT .....	Madras Rubber Factory, Ltd. (India).
WU .....	Not Assigned.
WV .....	Not Assigned.
WW .....	Not Assigned.
WX .....	Not Assigned.
WY .....	Not Assigned.
XA .....	Pirelli Tire Corp. (Italy).
XB .....	Pirelli Tire Corp. (Italy).
XC .....	Pirelli Tire Corp. (Italy).
XD .....	Pirelli Tire Corp. (Italy).
XE .....	Pirelli Tire Corp. (Italy).
XF .....	Pirelli Tire Corp. (Spain).
XH .....	Pirelli Tire Corp. (Greece).
XJ .....	Pirelli Tire Corp. (Turkey).
XK .....	Pirelli Tire Corp. (Brazil).
XL .....	Pirelli Tire Corp. (Brazil).
XM .....	Pirelli Tire Corp. (Argentina).
XN .....	Pirelli Tire Corp. (England).
XP .....	Pirelli Tire Corp. (England).
XT .....	Veith-Pirelli A.G. (Germany).

**TABLE 2. LIST OF NEW TIRE MANUFACTURERS AND CORRESPONDING  
IDENTIFICATION CODE MARKS**

**(Based on the following Alpha-numeric code with letters:  
ABCDEFGHIJKLMNPTZVWXY and Nos. 123456789)**

<i>Manufacturer</i>	<i>Identification code</i>	<i>Manufacturer</i>	<i>Identification code</i>
Alliance Tire & Rubber Co., Ltd.	CD.	The Lee Tire & Rubber Co.	JA, JB, JC, JD, JE, JF, JH, JJ, JK, JL, JM, JN, JP, JT, JU, JV, JW, JX, JY, KA, KB, KC, KD, KE, KF, KH, KJ, KK, KL, KM, KN, KP, KT, KU, KV, KW, KX, KY, LA, LB, LC, LD, LE, LF.
The Armstrong Rubber Co.	CE, CF, CH, CV.		
Avon Rubber Co.	AT.	Madras Rubber Factory, Ltd.	WT.
Bridgestone Tire Co., Ltd.	EH, EJ, EK, EL, EM, EN, EP.	The Mansfield Tire & Rubber Co.	WL.
Carlisle Tire & Rubber Division of Carlisle Corp.	UU.	Mansfield-Deman-General Co., Ltd.	LV.
Ceat	HT, HU, HV.	McCreary Tire & Rubber Co.	CY.
Continental A.G.	CM, CN, CP, CT, CU.	Metzeler A.G.	EA, EB, EC.
Copper Tire & Rubber Co.	UP, UT.	Michelin Tire Corp.	FF, FH, FJ, FK, FL, FM, FN, FP, FT, FU, FV, FW, FX, FY, HA, HB, HC, HD, HE, HF, HH, HJ, HK, HL, HM, HN, HP.
The Dayton Tire & Rubber Co.	HX, HY.		
Denman Rubber Manufacturing Co.	DY.	Mitsuboshi Belting, Ltd.	LX, LY.
The Dunlap Tire & Rubber Co.	DA, DB, DC, DD, DE, DF, DH, DJ, DK, DL, DM, DN, DP, DU.	The Mohawk Rubber Co.	CA, CB., CC
The Firestone Tire & Rubber Co.	VA, VB, VC, VD, VE, VF, VH, VJ, VK, VL, VM, VN, VP, VT, VV, VW, VX, VY, WA, WB, WC, WD, WF, WH, WJ.	Nitto Tire Co., Ltd.	EE.
The Gates Rubber Co.	BW, BX, BY.	Okamoto Riken Gumo Co., Ltd.	ED.
The General Tire & Rubber Co.	AA, AB, AC, AD, AE, AF, AH.	Olympic Tire & Rubber Co. Pty., Ltd.	WM, WN.
The B. F. Goodrich Co.	BA, BB, BC, BD, BE, BF, BH, BJ, BK, BL, BM, BN, BP.	Pennsylvania Tire & Rubber Company of Mississippi.	WK.
The Goodyear Tire & Rubber Co.	MA, MB, MC, MD, ME, MF, MH, MJ, MK, ML, MM, MN, MP, MT, MU, MV, MW, MX, MY, NA, NB, NC, ND, NE, NF, NH, NJ, NK, NL, NM, NN, NP, NT, NU, NV, NW, NX, NY, PA, PB, PC, PD, PE, PF.	Phoenix Gummiwerke A.G.	AX AY.
Hung Ah Tire Co., Ltd.	EF	Pirelli Tire Corp.	XA, XB, XC, XD, XE, XF, XH, XJ, XK, XL, XM, XN, XP.
IRI International BV. Rubber Co.	BV	Samson Tire & Rubber Co., Ltd.	AW.
Inoue Rubber Co., C.J. Ltd.	CJ	Schenuit Industries, Inc.	WP.
The Kelly-Springfield Tire Co.	PH, PJ, PK, PL, PM, PN, PP, PT, PU, PV, PW, PX, PY, TA, TB, TC, TD, TE, TF, TH, TJ, TK, TL, TM, TN, TP, TT, TU, TV, TW, TX, TY, UA, UB, UC, UD, UE, UF, UH, UJ, UK, UL, UM, UN.	The Seiberling Tire & Rubber Co.	AV.
Kleber-Colombes Co.	EV, EW, EX, EY.	Semperit Gummiwerke A.G.	BT, BU.
Kyowa Rubber Ind. Co., Ltd.		Sumitomo Rubber Industries	ET, EU.
		The Toyo Rubber Industry Co., Ltd.	CW, CX.
		Trelleborg Rubber Co.	LW.
		Uniroyal Inc.	AJ, AK, AM, AN, AP, AU, LH, LJ, LK, LL, LM, LN, LP, LT, LU.
		Veith-Pirelli A.G.	XT.
		Vredestein	DV, DW.
		Vredestein-Radium	DX.
		The Yokohama Rubber Co., Ltd.	FA, FB, FC, FD, FE.

**TABLE 3. TIRE SIZE CODES**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
AA	4.00-4	B7	5.00 R 12	D4	6.00 R 13
AB	3.50-4	B8	5.20-12	D5	6.2-13
AC	3.00-5	B9	5.20-12 LT	D6	6.20-13
AD	4.00-5	CA	5.20 R 12	D7	6.40-13
AE	3.50-5	CB	5.30-12	D8	6.40-13 LT
AF	6.90-6	CC	5.50-12	D9	6.40 R 13
AH	3.00-8	CD	5.50-12 LT	EA	6.50-13
AJ	3.50-6	CE	5.50 R 12	EB	6.50-13 LT
AK	4.10-6	CF	5.60-12	EC	6.50-13 ST
AL	4.50-6	CH	5.60-12 LT	ED	6.50 R 13
AM	5.30-6	CJ	5.60 R 12	EE	6.70-13
AN	6.00-6	CK	5.9-12	EF	6.70-13 LT
AP	3.25-8	CL	5.90-12	EH	6.70 R 13
AT	3.50-8	CM	6.00-12	EJ	6.9-13
AU	3.00-7	CN	6.00-12 LT	EK	6.90-13
AV	4.00-7	CP	6.2-12	EL	7.00-13
AW	4.80-7	CT	6.20-12	EM	7.00-13 LT
AX	5.30-7	CU	6.90-12	EN	7.00 R 13
AY	5.00-8	CV	23.5 X 8.5-12	EP	7.25-13
A1	H60-14	CW	125-12	ET	7.25 R 13
A2	4.00-8	CX	125 R 12	EU	7.50-13
A3	4.80-8	CY	125-12/5.35-12	EV	135-13
A4	5.70-8	C1	135-12	EW	135 R 13
A5	16.5 X 6.5-8	C2	135 R 12	EX	135-13/5.65-13
A6	18.5 X 8.5-8	C3	135-12/5.65-12	EY	145-13
A7	CR70-14	C4	145-12	E1	145 R 13
A8	2.75-9	C5	145 R 12	E2	145-13/5.95-13
A9	4.80-9	C6	145-12/5.95-12	E3	150 R 13
BA	6.00-9	C7	155-12	E4	155-13
BB	6.90-9	C8	155 R 12	E5	155 R 13
BC	3.50-9	C9	155-12/6.15-12	E6	155-13/6.15-13
BD	4.00-10	DA	4.80-10	E7	160 R 13
BE	3.00-10	DB	3.25-12	E8	165-13
BF	3.50-10	DC	3.50-12	E9	165 R 13
BH	5.20-10	DD	4.50-12 LT	FA	165-13/6.45-13
BJ	5.20 R 10	DE	5.00-12 LT	FB	165/70 R 13
BK	5.9-10	DF	7.00-12	FC	170 R 13
BL	5.90-10	DH	5.00-13	FD	175-13
BM	6.50-10	DJ	5.00-13 LT	FE	175 R 13
BN	7.00-10	DK	5.00 R 13	FF	175-13/6.95-13
BP	7.50-10	DL	5.20-13	FH	175/70 R 13
BT	9.00-10	DM	5.20 R 13	FJ	185-13
BU	20.5 X 8.0-10	DN	5.50-13	FK	185 R 13
BV	145-10	DP	5.50-13 LT	FL	185-13/7.35-13
BW	145 R 10	DT	5.50 R 13	FM	185/70 R 13
BX	145-10/5.95-10	DU	5.60-13	FN	195-13
BY	4.50-10 LT <sup>2</sup>	DV	5.60-13 LT	FP	195 R 13
B1	5.00-10 LT	DW	5.60 R 13	FT	195/70 R 13
B2	3.00-12	DX	5.90-13	FU	D70-13
B3	4.00-12	DY	5.90-13 LT	FV	B78-13
B4	4.50-12	D1	5.90 R 13	FW	BR78-13
B5	4.80-12	D2	6.00-13	FX	C78-13
B6	5.00-12	D3	6.00-13 LT	FY	7.50-12

<sup>1</sup> The letters "H", "S", and "V" may be included in the tire size designation adjacent to or in place of a dash without affecting the size code for the designation.

<sup>2</sup> As used in this table the letters at the end of the tire size indicate the following: LT—Light Truck, ML—Mining & Logging, MH—Mobile Home, ST—Special Trailer.



**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
F1	140 R 12	J3	175 R 14	L5	E78-14
F2	6.5-13	J4	185-14	L6	ER78-14
F3	185/60 R 13	J5	185 R 14	L7	F78-14
F4	A70-13	J6	185/70 R 14	L8	FR78-14
F5	A78-13	J7	195-14	L9	G78-14
F6	CR78-13	J8	195 R 14	MA	GR78-14
F7	2.25-14	J9	195/70 R 14	MB	H78-14
F8	2.75-14	KA	205-14	MC	HR78-14
F9	3.00-14	KB	205 R 14	MD	J78-14
HA	6.70-14 LT	KC	215-14	ME	JR78-14
HB	165-14 LT	KD	215 R 14	MF	205-14 LT
HC	2.50-14	KE	225-14	MH	G80-24.5
HD	5.00-14 LT	KF	225 R 14	MJ	H80-24.5
HE	5.20-14	KH	620 R 14	MK	7-14.5
HF	5.20 R 14	KJ	690 R 14	ML	8-14.5
HH	5.50-14 LT	KK	AR78-13	MM	9-14.5
HJ	5.60-14	KL	195-14 LT	MN	6.60 R 15
HK	5.90-14	KM	185-14 LT	MP	2.00-15
HL	5.90-14 LT	KN	A80-22.5	MT	2.25-15
HM	5.90 R 14	KP	B80-22.5	MU	2.50-15
HN	6.00-14	KT	C80-22.5	MV	3.00-15
HP	6.00-14 LT	KU	D80-22.5	MW	3.25-15
HT	6.40-14	KV	E80-22.5	MX	5.0-15
HU	6.40-14 LT	KW	F60-14	MY	5.20-15
HV	6.45-14	KX	C60-14	M1	5.5-15
HW	6.50-14	KY	J60-14	M2	5.50-15 L
HX	6.50-14 LT	K1	L60-14	M3	5.50-15 LT
HY	6.70-14	K2	F80-22.5	M4	5.60-15
H1	6.95-14	K3	G80-22.5	M5	5.60 R 15
H2	7.00-14	K4	H80-22.5	M6	5.90-15
H3	7.00-14 LT	K5	J80-22.5	M7	5.90-15 LT
H4	7.00 R 14	K6	A80-24.5	M8	6.00-15
H5	7.35-14	K7	B80-24.5	M9	6.00-15 L
H6	7.50-14	K8	BR78-14	NA	6.00-15 LT
H7	7.50-14 LT	K9	D70-14	NB	6.2-15
H8	7.50 R 14	LA	DR70-14	NC	6.40-15
H9	7.75-14	LB	E70-14	ND	6.40-15 LT
JA	7.75-14 ST	LC	ER70-14	NE	6.40 R 15
JB	8.00-14	LD	F70-14	NF	6.50-15
JC	8.25-14	LE	FR70-14	NH	6.50-15 L
JD	8.50-14	LF	G70-14	NJ	6.50-15 LT
JE	8.55-14	LH	GR70-14	NK	6.70-15
JF	8.85-14	LJ	H70-14	NL	6.70-15 LT
JH	9.00-14	LK	HR70-14	NM	6.70 R 15
JJ	9.50-14	LL	J70-14	NN	6.85-15
JK	135-14	LM	JR70-14	NP	6.9-15
JL	135 R 14	LN	L70-14	NT	7.00-15
JM	135-14/5.65-14	LP	LR70-14	NU	7.00-15 L
JN	145-14	LT	C80-24.5	NV	7.00-15 LT
JP	145 R 14	LU	D80-24.5	NW	7.10-15
JT	145-14/5.95-14	LV	E80-24.5	NX	7.10-15 LT
JU	155-14	LW	F80-24.5	NY	7.35-15
JV	155 R 14	LX	G77-14	N1	7.50-15
JW	155-14/6.15-14	LY	B78-14	N2	7.60-15
JX	155/70 R 14	L1	C78-14	N3	7.60 R 15
JY	165-14	L2	CR78-14	N4	7.75-15
J1	165 R 14	L3	D78-14	N5	7.75-15 ST
J2	175-14	L4	DR78-14	N6	8.00-15

**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
N7	8.15-15	T9	205/70 R 14	WB	11.00-15
N8	8.20-15	UA	215/70 R 14	WC	2.25-16
N9	8.25-15	UB	H60-15	WD	2.50-16
PA	8.25-15 LT	UC	E60-15	WE	3.00-16
PB	8.45-15	UD	F60-15	WF	3.25-16
PC	8.55-15	UE	FR60-15	WH	3.50-16
PD	8.85-15	UF	G60-15	WJ	5.00-16
PE	8.90-15	UH	GR60-15	WK	5.10-16
PF	9.00-15	UJ	J60-15	WL	5.50-16 LT
PH	9.00-15 LT	UK	L60-15	WM	6.00-16
PJ	9.15-15	UL	4.60-15	WN	6.00-16 LT
PK	10-15	UM	2.75-15	WP	6.50-16
PL	10.00-15	UN	2.50-9	WT	6.50-16 LT
PM	7.50-15 LT	UP	2.50-10	WU	6.70-16
PN	7.00-15 TR	UT	5.00-9	WV	7.00-16
PP	8.25-15 TR	UU	6.7-10	WW	7.00-16 LT
PT	9.00-15 TR	UV	C70-15	WX	7.50-16
PU	7.50-15 TR	UW	D70-15	WY	7.50-16 LT
PV	125-15	UX	DR70-15	W1	8.25-16
PW	125 R 15	UY	E70-15	W2	9.00-16
PX	125-15/5.35-15	U1	ER70-15	W3	10-16
PY	135-15	U2	F70-15	W4	8.25-16 LT
P1	135 R 15	U3	FR70-15	W5	9.00-16 LT
P2	135-15/5.65-15	U4	G70-15	W6	11.00-16
P3	145-15	U5	GR70-15	W7	19-400 C
P4	145 R 15	U6	H70-15	W8	165-400
P5	145-15/5.95-15	U7	HR70-15	W9	235-16
P6	155-15	U8	J70-15	XA	185-16
P7	155 R 15	U9	JR70-15	XB	19-400 LT
P8	155-15/6.35-15	VA	K70-15	XC	G45C-16
P9	165-15	VB	KR70-15	XD	E50C-16
TA	165-15 LT	VC	L70-15	XE	F50C-16
TB	165 R 15	VD	LR70-15	XF	7.00-16 TR
TC	175-15	VE	17-400 TR	XH	7.50-16 TR
TD	175 R 15	VF	185-300 TR	XJ	8.00-16.5
TE	175-15/7.15-15	VH	185-300 LT	XK	8.75-16.5
TF	175/70 R 15	VJ	AR78-15	XL	9.50-16.5
TH	180-15	VK	BR78-15	XM	10-16.5
TJ	185-15	VL	C78-15	XN	12-16.5
TK	185 R 15	VM	D78-15	XP	185 R 16
TL	185/70 R 15	VN	E78-15	XT	4.50-17
TM	195-15	VP	ER78-15	XU	2.00-17
TN	195 R 15	VT	F78-15	XV	2.25-17
TP	205-15	VU	FR78-15	XW	2.50-17
TT	205 R 15	VV	G78-15	XX	2.75-17
TU	215-15	VW	GR78-15	XY	3.00-17
TV	215 R 15	VX	H78-15	X1	3.25-17
TW	225-15	VY	HR78-15	X2	3.50-17
TX	225 R 15	V1	J78-15	X3	6.50-17
TY	235-15	V2	JR78-15	X4	6.50-17 LT
T1	235 R 15	V3	L78-15	X5	7.00-17
T2	J80-24.5	V4	LR78-15	X6	7.50-17
T3	ER60-15	V5	N78-15	X7	8.25-17
T4	D78-13	V6	17-15 (17-380 LT)	X8	7.50-17 LT
T5	A78-15	V7	17-400 LT	X9	225/70 R 14
T6	DR70-13	V8	11-15	YA	G50C-17
T7	HR60-15	V9	11-16	YB	H50C-17
T8	E60-14	WA	L84-15	YC	195/70 R 15

**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
YD	4.20-18	2F	9.00-20	4J	13.5-24.5
YE	8-17.5 LT	2H	9.4-20	4K	7.00-20 ML
YF	11-17.5	2J	10.00-20	4L	7.50-20 ML
YH	7-17.5	2K	10.3-20	4M	8.25-20 ML
YJ	8-17.5	2L	11.00-20	4N	9.00-20 ML
YK	8.5-17.5	2M	11.1-20	4P	10.00-20 ML
YL	9.5-17.5	2N	11.50-20	4T	10.00-22 ML
YM	10-17.5	2P	11.9-20	4U	10.00-24 ML
YN	14-17.5	2T	12.00-20	4V	11.00-20 ML
YP	9-17.5	2U	12.5-20	4W	11.00-22 ML
YT	205/70 R 15	2V	13.00-20	4X	11.00-24 ML
YU	2.25-18	2W	14.00-20	4Y	11.00-25 ML
YV	2.50-18	2X	6.50-20 LT	41	12.00-20 ML
YW	2.75-18	2Y	7.00-20 LT	42	12.00-21 ML
YX	3.00-18	21	13/80-20	43	12.00-24 ML
YY	3.25-18	22	14/80-20	44	12.00-25 ML
Y1	3.50-18	23	2.75-21	45	13.00-20 ML
Y2	4.00-18	24	3.00-21	46	13.00-24 ML
Y3	4.50-18	25	2.50-21	47	13.00-25 ML
Y4	6.00-18	26	2.75-20	48	14.00-20 ML
Y5	7.00-18	27	10.00-22	49	14.00-21 ML
Y6	7.50-18	28	11.00-22	5A	14.00-24 ML
Y7	8.25-18	29	11.1-22	5B	14.00-25 ML
Y8	9.00-18	3A	11.9-22	5C	10.3-20 ML
Y9	10.00-18	3B	12.00-22	5D	11.1-20 ML
1A	11.00-18	3C	14.00-22	5E	12.5-20 ML
1B	6.00-18 LT	3D	11.50-22	5F	9-22.5 ML
1C	6.00-20 LT	3E	4.10-18	5H	9.4-22.5 ML
1D	L50C-18	3F	4.10-19	5J	10-22.5 ML
1E	7.00-18 LT	3H	7-22.5	5K	10.3-22.5 ML
1F	12-19.5	3J	8-22.5	5L	11-22.5 ML
1H	2.00-19	3K	8.5-22.5	5M	11-24.5 ML
1J	2.25-19	3L	9-22.5	5N	14-17.5 ML
1K	2.50-19	3M	9.4-22.5	5P	15-19.5 ML
1L	2.75-19	3N	10-22.5	5T	15-22.5 ML
1M	3.00-19	3P	10.3-22.5	5U	16.5-19.5 ML
1N	3.25-19	3T	11-22.5	5V	16.5-22.5 ML
1P	3.50-19	3U	11.1-22.5	5W	18-19.5 ML
1T	4.00-19	3V	11.5-22.5	5X	18-22.5 ML
1U	11.00-19	3W	11.9-22.5	5Y	19.5-19.5 ML
1V	9.5-19.5	3X	12-22.5	51	23-23.5 ML
1W	10-19.5	3Y	12.5-22.5	52	18-21 ML
1X	11-19.5	31	15-22.5	53	19.5-21 ML
1Y	7-19.5	32	16.5-22.5	54	23-21 ML
11	7.5-19.5	33	18-22.5	55	6.00-13 ST
12	8-19.5	34	215/70 R 15	56	7.35-14 ST
13	9-19.5	35	225/70 R 15	57	8.25-14 ST
14	14-19.5	36	185/60 R 13	58	7.35-15 ST
15	15-19.5	38	9.00-24	59	8.25-15 ST
16	16.5-19.5	38	10.00-24	6A	12.00-22 ML
17	18-19.5	39	11.00-24	6B	4.30-18
18	19.5-19.5	4A	12.00-24	6C	3.60-19
19	6.00-20	4B	14.00-24	6D	3.00-20
2A	6.50-20	4C	3.50-7	6E	4.25-18
2B	7.00-20	4D	3.00-4	6F	MP90-18
2C	7.50-20	4E	12.5-24.5	6H	3.75-19
2D	8.25-20	4F	11-24.5	6J	MM90-19
2E	8.5-20	4H	12-24.5	6K	3.25-7



**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND  
RECORDKEEPING**

**(Docket No. 70-12; Notice No. 9)**

**Amendment to Figure 2 Concerning the Location of the Tire Identification Number  
for Retreaded Tires**

The purpose of this amendment is to provide retreaders with an alternative location for the placement of the tire identification number.

On January 26, 1971, the National Highway Traffic Safety Administration published Docket No. 70-12, Notice No. 5, a revised version of the Tire Identification and Record Keeping Regulation, 49 CFR Part 574 (36 F.R. 1196). Section 574.5 requires retreaders to permanently mold or brand into or onto one sidewall a tire identification number in the manner specified in Figure 2 of the regulation. Figure 2 requires that the tire identification number be located in the area of the shoulder between the tread edge and the maximum section width of the tire. The regulation specified this location because, generally, it is the area upon which retreaders apply new retread material.

Bandag, Inc., has petitioned for rulemaking to allow the tire identification to be below the section width of the tire. The petition requests this relief because the Bandag process only affects the tread surface, a comparatively smooth surface is needed for application of the identification number, and many casings have no smooth area

between the tread edge and the maximum section width.

Therefore, in view of the above, Figure 2 of Part 574 (36 F.R. 1200) is hereby amended as set forth below to require that the tire identification number be on one sidewall of the tire, either on the upper segment between the maximum section width and the tread edge, or on the lower segment between the maximum section width and bead in a location such that the number will not be covered by the rim flange when the tire is inflated. In no event should the number be on the surface of the scuff rib or ribs.

*Effective date:* May 22, 1971.

Because this amendment relieves a restriction and does not impose any additional burden on any person it is found that notice and public procedure thereon are unnecessary and impracticable, and that, for good cause shown, an effective date less than 30 days after the date of issuance is in the public interest.

Issued on May 21, 1971.

Douglas W. Toms  
Acting Administrator



**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORD KEEPING**

(Docket No. 70-14; Notice 15)

The purpose of this amendment to Part 574 of Title 49, Code of Federal Regulations, is to provide that the second group of symbols within the tire identification number shall, in the case of new tires, be assigned at the option of the manufacturer rather than conforming to the tire size code presently found in Table I of the regulation.

Under the present system, even if the presently unassigned symbols "O" and "R" are used, a maximum of 900 tire size codes can be assigned. Due to the many new tire sizes being introduced, it is necessary to change the system to allow more flexibility. Therefore, Table I is herewith deleted, new tire manufacturers are allowed to assign their own two-digit code for the tire size, and retreaders are allowed to use either a self-assigned matrix code or a self-assigned tire size code. Each new tire manufacturer will still be required to use a two-symbol size code and to maintain a record of the coding system used, which shall be provided to the National Highway Traffic Safety Administration upon written request. It is recommended but not required that manufacturers use the code sizes previously assigned by this agency for active sizes, and reuse the codes for obsolete sizes when additional size codes are needed.

A notice of proposed rulemaking on this subject was published on June 16, 1972 (37 F.R. 11979). The comments received in response to the notice have been considered in the issuance of this final rule. The rule is issued as it appeared in the proposal including the letter "T" inadvertently omitted from the proposal.

Three of the tire manufacturers who commented favored the proposed change, and the National Tire Dealers and Retreaders Association, the Japan Automobile Manufacturers Association and The European Tyre and Rim

Technical Organisation commented without objection to the proposed change.

Bandag, Inc., a retreader of tires, objected to the proposed change on the grounds that allowing tire manufacturers to assign their own tire size code would remove one of the methods a retreader has to determine the tire size of a casing to be retreaded.

Mercedes-Benz of North America and Volkswagen of America did not favor the change because of the possibility of confusion for the vehicle manufacturer that equips its vehicle with several manufacturers' tires.

The principal objection raised by Bandag should be considerably alleviated by an amendment to Standard No. 109 (36 F.R. 24824) under consideration, which would require tire manufacturers to place the actual tire size, as well as other pertinent information, between the section width and the bead of the tire so that the information will be less susceptible to obliteration during use or removal during the retreading process.

With respect to the comment by Mercedes-Benz of North America and Volkswagen of America, it was concluded that because the existing system does not provide enough symbols to meet the anticipated introduction of new tire sizes, the proposed change is necessary. Mercedes' recommendation that "G", "Q", "S", and "Z" be added or that a three-digit size code be used was rejected, because the additional symbols suggested are difficult to apply to the tire, and the addition of a third symbol would, according to the tire manufacturers, be impractical and inefficient.

A list of the tire size codes assigned up to this time is published in the general notice section of this issue of the *Federal Register* (37 F.R. 23742). The NHTSA urges tire manufacturers to use



**Effective: November 8, 1972**

these existing codes for tire sizes presently being produced and to work within their tire and rim associations to make code assignments for new tire sizes on an industry-wide basis and reuse obsolete size codes wherever possible. In this way the usefulness of the tire size code to the vehicle manufacturer will be maintained.

In consideration of the foregoing, in Part 574 of Title 49, Code of Federal Regulations, Table I is deleted and § 574.5 is amended . . . .

*Effective date:* November 8, 1972.

Because this amendment relieves a restriction, and because of the immediate need for the introduction of new tire size codes, it is found for

good cause shown that an effective date less than 30 days from the date of issuance is in the public interest.

Issued under the authority of sections 103, 112, 113, 119 and 201 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1401, 1402, 1407 and 1421, and the delegation of authority at 49 CFR 1.51.

Issued on October 31, 1972.

Charles H. Hartman  
Acting Administrator

**37 F.R. 23727**  
**November 8, 1972**

**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING**

(Docket No. 71-18; Notice 7)

This notice amends Standard No. 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, to specify lettering sizes and modified treadwear indicator requirements for tires. In addition, it amends Part 574, *Tire Identification*, 49 CFR 574, to permit the labeling of certain tires with the symbol DOT prior to the effective date of the standard. This notice also responds to petitions for reconsideration of Standard 119's effective date by maintaining the present date of March 1, 1975.

To avoid a costly production shutdown on the effective date to engrave tire molds with the DOT compliance symbol required by the standard, the National Highway Traffic Safety Administration (NHTSA) proposed a modification of the Part 574 prohibition on the symbol's use prior to the effective date (39 F.R. 3967, January 31, 1974). The Rubber Manufacturers Association and five tire manufacturers agreed that the DOT should be engraved on tire molds prior to the effective date, but objected to the expense of covering the DOT with a label stating that "no Federal motor vehicle safety standard applies to this tire," when the DOT appears on tires which (presumably) satisfy Standard 119 requirements. Firestone pointed out that the large label size could obscure other label information. Goodrich noted that, as proposed, the DOT could be molded on tires which met no standard and could mislead a user if the label fell off.

The NHTSA will not permit the appearance of the DOT compliance symbol on any item of motor vehicle equipment to which no standard is applicable. The terms "applicability" and "applies" have only one meaning for Federal motor vehicle safety standards: that the vehicle or equipment concerned is subject to a safety standard. To permit use of the DOT symbol on

vehicles or items of motor vehicle equipment to which no standard applies would confuse the meaning of the symbol and the concept of compliance.

In response to Firestone and Goodrich, the NHTSA has modified the lettering size on the label and limited use of the DOT symbol to tires for which a standard has been issued. With the small lettering size, the rubber labels used on retread tires can be applied over the DOT symbol in fulfillment of the requirement. Another method which manufacturers did not mention but which would be permissible is the removal of the DOT at the same time imperfections are buffed off the tire.

All comments on the proposal objected to the specific location requirements for treadwear indicators based on the concept of even tread wear across the tread width. Goodyear demonstrated in a meeting with the NHTSA Tire Division on February 13, 1974, and detailed in its submission to the Docket, the difficulty in equating ideal tire wear with actual road experience. They recommended the simpler concept that a tire has worn out when any major tread groove has only  $\frac{2}{32}$  in tread remaining. The NHTSA has concluded that treadwear indicators must be placed at the discretion of the manufacturer to give a person inspecting the tire visual indication of whether the tire has worn to a certain tread depth. Accordingly, the lateral location requirements for treadwear indicators have been deleted from the standard.

There was no discussion of the lettering size and depth proposal, and these proposals are adopted as proposed.

The comments requested reconsideration of the standard's March 1, 1975, effective date (published February 1, 1974, 39 F.R. 4087), asserting the need for 18 months of lead time following

**Effective: April 3, 1974**

publication of this notice to engrave tire molds as required by the standard. The NHTSA has found that 11 months is sufficient leadtime to accomplish these changes, and accordingly these petitions are denied.

To correct an inadvertent omission in the amendment of Standard No. 119 in response to petitions for reconsideration (39 F.R. 5190, February 11, 1974), superscripts are added to Table III entries for "All other, A, B, C, D range tires".

In consideration of the foregoing, Parts 571 and 574 of Title 49, Code of Federal Regulations, are amended. . . .

*Effective date:* Standard No. 119 amendments: March 1, 1975. Part 574 amendment: April 3,

1974. Because the Part 574 amendment creates no additional burden, and because modification of tire molds must begin immediately, it is found for good cause shown that an effective date less than 180 days after issuance is in the public interest.

(Secs. 103, 112, 119, 201, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on March 28, 1974.

James B. Gregory  
Administrator

**39 F.R. 12104**  
**April 3, 1974**



## PREAMBLE TO AMENDMENT TO PART 574— TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice 19)

This notice amends the Tire Identification and Recordkeeping regulation, 49 CFR Part 574, to establish an optional universal registration format for tire registration forms. It also requires manufacturers of new tires to redirect registration forms of other manufacturers of new tires which have been forwarded to them in error.

On March 9, 1973, the NHTSA issued a notice of proposed rulemaking (38 F.R. 6398) proposing a universal registration form for tire identification and record keeping. The notice was issued in response to requests from multi-brand tire dealers who were faced with a multiplicity of different forms and procedures for tire registration. Currently, the regulation merely requires manufacturers and retreaders to supply a "means" of registration. The proposed rule also envisioned that a copy of the form would be provided to the first purchaser and that manufacturers and retreaders would be required to redirect registration forms which had been forwarded to them in error.

All comments received in response to the notice were sympathetic to the problems faced by the multi-brand dealers, and the majority were willing to provide a "universal form" if requested by a dealer.

Most manufacturers, however, pointed out that their exclusive dealerships had received training in the use of the current form, as had their own personnel, and that a total change-over would work a hardship without a concomitant benefit for single-brand dealers. In view of these comments, NHTSA has decided to promulgate the universal registration format, which appears as Fig. 3, as an optional format to be followed if requested by a dealer and as a guide if a dealer prefers to supply his own forms.

The proposal to require tire manufacturers and retreaders to forward all misdirected registration forms within 30 days was universally opposed by new-tire manufacturers, who stated that they are currently participating in a voluntary but limited program for forwarding these misdirected forms. Furthermore, new-tire manufacturers believe they should not be responsible for misdirected retreaded tire registration forms, as there are over 5,000 tire retreaders in the country and such a task would be formidable. One new-tire manufacturer indicated that he had received over 15,000 misdirected retreaded tire registration forms during January 1973. The docket contained only one submission from the retreading industry, and it did not deal with the problem of misdirected forms.

It also appears from the comments received and other information available to NHTSA that new-tire manufacturers maintain a computer-based registration process, while only approximately 25% of the retreading industry utilizes computers for this purpose. Thus, the requirement for forwarding all misdirected forms would fall heavily on both segments of the industry, new-tire manufacturers in that most misdirected forms appear to be sent to them and retreaders in that a majority are ill-equipped to carry out the forwarding functions.

Therefore, rather than issue an all-inclusive forwarding requirement at this time, NHTSA has decided to require only that new-tire manufacturers redirect new tire registration forms erroneously forwarded to them. Further, the NHTSA has determined that a 90-day forwarding period will be sufficient, rather than the 30 days originally proposed. It is expected that the use of the manufacturer's logo on the universal registration format and increased vigilance

on the part of the industry will substantially curtail the number of misdirected forms. If it later appears that tire registrations are not being properly received, the NHTSA intends to take further action in this area.

The notice proposed that tire manufacturers furnish their dealers with duplicate copies of the registration form so that a copy could be given to consumers at the time of purchase. This provision was objected to by all new-tire manufacturers and the retreaders' association. In their view, the increased expense served no viable function as Part 574 currently requires all purchasers to be notified by certified mail of safety defects. They argued that the possession of a duplicate registration form would not aid the purchaser in the case of recall. The manufacturers also said that the completion of registration forms is often reserved until the end of the day or other slack time, and further that the

consumer automatically receives a copy of his tire identification number on the guarantee if one is given.

The NHTSA finds these arguments to have merit, and the requirement to give the purchaser a copy of the registration form is deleted from the final rule.

In consideration of the foregoing, 49 CFR 574.7 is amended. . . .

*Effective date:* September 3, 1974.

(Secs. 103, 112, 113, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on May 28, 1974.

James B. Gregory  
Administrator

**39 F.R. 19482**  
**June 3, 1974**

**PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING**

(Docket No. 70-12; Notice 21)

This notice amends 49 CFR Part 574 to provide that the Universal Registration Forms supplied by dealers must conform in size and be similar in format to Figure 3 of the regulation.

On June 2, 1974, 49 CFR Part 574 was amended to require a Universal Registration Format when tire registration forms are supplied by manufacturers to dealers (39 F.R. 19482). Three petitions for reconsideration were received in response to this notice. All three, Michelin Tire Corporation, Rubber Manufacturers Association, and the Firestone Tire and Rubber Company, requested that the regulation be amended to require that dealer-supplied registration forms also conform in size and be similar in format to Figure 3 of the regulation. The petitioners pointed out that registration handling methodology has been standardized throughout the industry, and that the use of different sizes and formats would be costly and inefficient. The NHTSA concurs in this assessment, and therefore amends 49 CFR 574.7(a) to require that the dealer-supplied forms must conform in size and be similar in format to Figure 3.

In addition, Firestone petitioned to revise Figure 3 slightly and to extend the effective date of the amendment to 120 days after the response to the petitions for reconsideration. Since 49 CFR 574.7 currently requires only that the forms be "similar" to Figure 3, Firestone's proposed modification is authorized by the regulation and no amendment to the standard is needed. Firestone's request to extend the effective date of the standard is denied, as NHTSA has determined sufficient lead time was available from the date the amendment was issued to prepare forms.

In consideration of the foregoing, the last sentence of 49 CFR 574.7(a) is amended. . . .

*Effective date:* November 1, 1974.

(Secs. 103, 112, 113, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on October 29, 1974.

James B. Gregory  
Administrator

**39 F.R. 38658**  
**November 1, 1974**





## **PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING**

**(Docket No. 70-12; Notice 22)**

This notice corrects the authority citations to Part 574, *Tire Identification and Recordkeeping*, and makes other small corrections of citations in the text of the regulation to reflect statutory amendments. This correction is being made to conform the statutory authority citations to the existing statute.

**Effective dates:** Since these technical corrections do not affect the responsibilities under the regulation, they are made effective December 26, 1978.

**For further information contact:**

Roger Tilton, Office of Chief Counsel,  
National Highway Traffic Safety Administration,  
400 Seventh Street, S.W., Washington,  
D.C. 20590 (202-426-2992).

**Supplementary information:** Since issuance of the Tire Identification and Recordkeeping regulation, several changes have been made to the agency's authorizing statute that require NHTSA to correct the authority citations of the regulation. While authority citations found in NHTSA's regulations and standards are not parts of the rules, they are useful to those who wish to review the legislative background of the rulemaking action. Therefore, NHTSA corrects the authority citations for clarity and to provide information to those who are interested.

The agency also corrects Part 574.2 and 574.8 by altering the existing reference to section 113. Section 113 was the safety defect and noncompliance notification section of the National Traffic

and Motor Vehicle Safety Act of 1966 (Pub. L. 89-563). Section 102 of the 1974 Motor Vehicle and Schoolbus Safety Amendments (Pub. L. 93-492) transferred the notification provisions from section 113 to section 151 and 152 of the Safety Act, as amended (15 U.S.C. 1411 and 1412). Since the regulation currently refers to the old Act rather than the Act as amended, the agency is correcting the affected provisions of the regulation to bring them up to date.

Since this notice simply corrects references in the regulation and its authority citations without altering any of its substantive provisions, the Administrator finds that notice is unnecessary and that an immediate effective date is in the public interest.

In consideration of the foregoing, Volume 49 of the Code of Federal Regulations, Part 574, *Tire Identification and Recordkeeping*, is amended. . . .

(Secs. 103, 108, 112, 119, 201, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1397, 1401, 1407, 1421); Secs. 102, 103, 104, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1397, 1401, 1411-1420); delegation of authority at 49 CFR 1.50).

Issued on December 18, 1978.

Joan Claybrook  
Administrator

**43 F.R. 60171  
December 26, 1978**





## PREAMBLE TO AMENDMENT TO PART 574—TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice 23)

*Action:* Amendment of rule.

*Summary:* Congress has recently amended the National Traffic and Motor Vehicle Safety Act of 1966 (the Safety Act) to exempt manufacturers of retreaded tires from the registration requirements of the Act. This notice makes conforming amendments to the regulations implementing the tire registration requirements of the Act. The amendment is being published as a final rule without notice and opportunity for comment and is effective immediately, rather than 180 days after issuance, since the agency lacks discretion on the manner implementing this Congressional mandate.

*Effective date:* February 8, 1979.

*For further information contact:*

Arturo Casanova, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-1715.

*Supplementary information:* Congress has recently enacted the Surface Transportation Assistance Act of 1978, P.L. 95-599. Section 317 of that Act amends the Safety Act by exempting manufacturers of retreaded tires from the registration requirements of section 158(b) of the Safety Act.

This amendment modifies the requirements of Part 574 to specify that manufacturers of retreaded tires are not subject to the mandatory registration requirements set forth in that Part. Manufacturers of retreaded tires are free to continue voluntarily registering the tires, and the agency encourages these manufacturers to provide some means for notifying purchasers in the event of a recall of tires that do not comply with

federal safety standards or contain a safety-related defect. However, this choice will be left to the individual retreaders.

The remaining obligations of retreaders under Part 574 are set forth in §§ 574.5 and 574.6, which provisions are not affected by this amendment. Those sections require that the retreader label contain certain information on its tires. These provisions allow a retreader who determines that some of its tires do not comply with a Federal safety standard or contain a safety-related defect to warn the public of that fact, and indicate the label numbers of the affected tires.

Since Congress has amended the Safety Act to exempt the manufacturers of retreaded tires from the registration requirements, this amendment of Part 574 is published without notice and opportunity for comment. The Administrator finds good cause for foregoing these procedures in this instance, because Congress has specifically mandated this action, and the agency has no authority to disregard a legislative mandate. For the same reason, this amendment is effective immediately, rather than 180 days after issuance.

The agency has reviewed the impacts of this amendment and determined that they will reduce costs to the manufacturers. Further, the agency has determined that the amendment is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this amendment are Arturo Casanova and Stephen Kratzke, respectively.

In consideration of the foregoing, 49 CFR Part 574, Tire Identification and Recordkeeping, is amended . . . .

AUTHORITY : Sections 103, 108, 112, 119, 201,  
Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392,  
1397, 1401, 1407, 1421) ; secs. 102, 103, 104, Pub.  
L. 93-492, 88 Stat. 1470 (15 U.S.C. 1411-1420) ;  
Stat. 2689 (15 U.S.C. 1418) ; delegation of au-  
thority at 49 CFR 1.51.

Issued on January 31, 1979.

Joan Claybrook  
Administrator

**44 F.R. 7963**  
**February 8, 1979**

## PART 574—TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice No. 5)

*Sec.*

- 574.1 Scope.**
- 574.2 Purpose.**
- 574.3 Definitions.**
- 574.4 Applicability.**
- 574.5 Tire identification requirements.**
- 574.6 Identification mark.**
- 574.7 Information requirements—tire manufacturers, brand name owners, retreaders.**
- 574.8 Information requirements—tire distributors and dealers.**
- 574.9 Requirements for motor vehicle dealers.**
- 574.10 Requirements for motor vehicle manufacturers.**

**AUTHORITY:** The provisions of this Part 574 issued under secs. 103, 112, 113, 119, 201, and 206, National Traffic and Motor Vehicle Safety Act of 1966, as amended, 15 U.S.C. 1392, 1401, 1402, 1407, 1421, and 1426; delegation of authority at 49 CFR 1.51, 35 F.R. 4955.

### **§ 574.1 Scope.**

This part sets forth the method by which manufacturers, brand name owners, and retreaders shall identify tires for use on motor vehicles and maintain records of tire purchasers, and the method by which distributors and dealers of new and retreaded tires shall record and report the names of tire purchasers to manufacturers, brand name owners and retreaders.

### **§ 574.2 Purpose.**

The purpose of this part is to facilitate notification to purchasers of defective or nonconforming tires, pursuant to sections 151 and 152 of the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1411 and 1412). (hereafter the Act), so that they may take appropriate action in the interest of motor vehicle safety.

### **§ 574.3 Definitions.**

(a) *Statutory definitions.* All terms in this part that are defined in section 102 of the Act are used as defined therein.

(b) *Motor vehicle safety standard definitions.* Unless otherwise indicated, all terms used in this part that are defined in the Motor Vehicle Safety Standards, part 571 of this subchapter (hereinafter the Standards), are used as defined therein.

(c) *Definitions used in this part.* (1) "Mileage contract purchaser" means a person who purchases or leases tire use on a mileage basis.

(2) "Tire brand name owner" means a person, other than a tire manufacturer, who owns or has the right to control the brand name of a tire or a person who licenses another to purchase tires from a tire manufacturer bearing the licensor's brand name.

(3) "Tire purchaser" means a person who buys or leases a new or newly retreaded tire, or who buys or leases for 60 days or more a motor vehicle containing a new tire or a newly retreaded tire, for purposes other than resale.

### **§ 574.4 Applicability.**

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948. However, it does not apply to persons who retread tires solely for their own use.

### **§ 574.5 Tire identification requirements.**

Each tire manufacturer shall conspicuously label on one sidewall of each tire he manufactures, except tires manufactured exclusively for mileage contract purchasers, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number containing the information set forth in paragraphs (a) through (d) of this



section. Each tire retreader, except tire retreaders who retread tires for their own use, shall conspicuously label one sidewall of each tire he retreads by permanently molding or branding into or onto the sidewall, in the manner and location specified in Figure 2, a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by Federal Motor Vehicle Safety Standards shall be located as shown in Figures 1 and 2. The DOT symbol shall not appear on tires to which no Federal Motor Vehicle Safety Standard is applicable, unless, in the case of tires for which a standard has been issued but which is not yet effective, the symbol is covered by a label that is not easily removable and that states in letters at least 0.078 inches high:

NO FEDERAL MOTOR  
VEHICLE SAFETY  
STANDARD APPLIES  
TO THIS TIRE

The symbols to be used in the tire identification number for tire manufacturers and retreaders are "A, B, C, D, E, F, H, J, K, L, M, N, P, R, T, U, V, W, X, Y, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0." Tires manufactured or retreaded exclusively for mileage contract purchasers are not required to contain the tire identification number if the tire contains the phrase "for mileage contract use only" permanently molded into or onto the tire sidewall in lettering at least one-quarter inch high.

(a) First grouping. The first group, of two or three symbols, depending on whether the tire is new or retreaded, shall represent the manufacturer's assigned identification mark (see § 574.6).

(b) Second grouping. For new tires, the second group, of no more than two symbols, shall be used to identify the tire size. For retreaded tires, the second group, of no more than two symbols, shall identify the retread matrix in which the tire was processed or a tire size code if a matrix was not used to process the retreaded tire. Each new tire manufacturer and retreader shall maintain a record of each symbol used, with the corresponding matrix or tire size and shall provide such record to NHTSA upon written request.

(c) Third grouping. The third group, consisting of no more than four symbols, may be used at the option of the manufacturer or retreader as a descriptive code for the purpose of identifying significant characteristics of the tire. However, if the tire is manufactured for a brand name owner, one of the functions of the third grouping shall be to identify the brand name owner. Each manufacturer or retreader who uses the third grouping shall maintain a detailed record of any descriptive or brand name owner code used, which shall be provided to the Bureau upon written request.

(d) Fourth grouping. The fourth group, of three symbols, shall identify the week and year of manufacture. The first two symbols shall identify the week of the year using "01" for the first full calendar week in each year. The final week of each year may include not more than 6 days of the following year. The third symbol shall identify the year. (Example: 311 means the 31st week of 1971, or Aug. 1 through 7, 1971; 012 means the first week of 1972, or Jan. 2 through 8, 1972.) The symbols signifying the date of manufacture shall immediately follow the optional descriptive code (paragraph (c) of this section). If no optional descriptive code is used the symbols signifying the date of manufacture shall be placed in the area shown in Figures 1 and 2 for the optional descriptive code.

#### **§ 574.6 Identification mark.**

To obtain the identification mark required by § 574.5(a), each manufacturer of new or retreaded motor vehicle tires shall apply after November 30, 1970, in writing to Tire Identification and Recordkeeping, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, D.C. 20590, identify himself as a manufacturer of new tires or retreaded tires, and furnish the following information:

(a) The name, or other designation identifying the applicant, and his main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., passenger car tires, bus tires, truck tires, motorcycle tires, or retreaded tires.

**§ 574.7 Information requirements—tire manufacturers, brand name owners, retreaders.**

(a) Each tire manufacturer, brand name owner and retreader (hereinafter referred to in this section and § 574.8 as "tire manufacturer" unless specified otherwise), or his designee, shall provide forms to every distributor and dealer of his tires who offers these tires for sale or lease to tire purchasers, by which the distributor or dealer may record the information appearing in paragraphs (a)(1), (a)(2) and (a)(3) of this section. Forms conforming in size and similar in format to Figure 3 shall be provided to those dealers who request them, or if a dealer prefers, he may supply his own form as long as it contains the required information, conforms in size, and is similar in format to Figure 3.

- (1) Name and address of the tire purchaser;
- (2) Tire identification number;

(3) Name and address of the tire seller or other means by which the manufacturer can identify the tire seller.

(b) Each tire manufacturer shall record and maintain or have recorded and maintained for him, the information specified in paragraph (a) of this section and shall not use this information for any commercial purpose detrimental to tire distributors or dealers. Any new-tire manufacturer to whom forms are mistakenly returned shall forward the new-tire registration forms to the proper new-tire manufacturer within 90 days from receipt of the form.

(c) Each tire manufacturer shall maintain, or have maintained for him, a record of each tire distributor or dealer who purchases tires directly from him and sells them to tire purchasers, the number of tires purchased by each such distributor or dealer, the number of tires for which

**Notes:**

1. Tire identification number shall be in Futura Bold, Modified Condensed or Gothic characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side. (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area
4. Other print type will be permitted if approved by the administration.

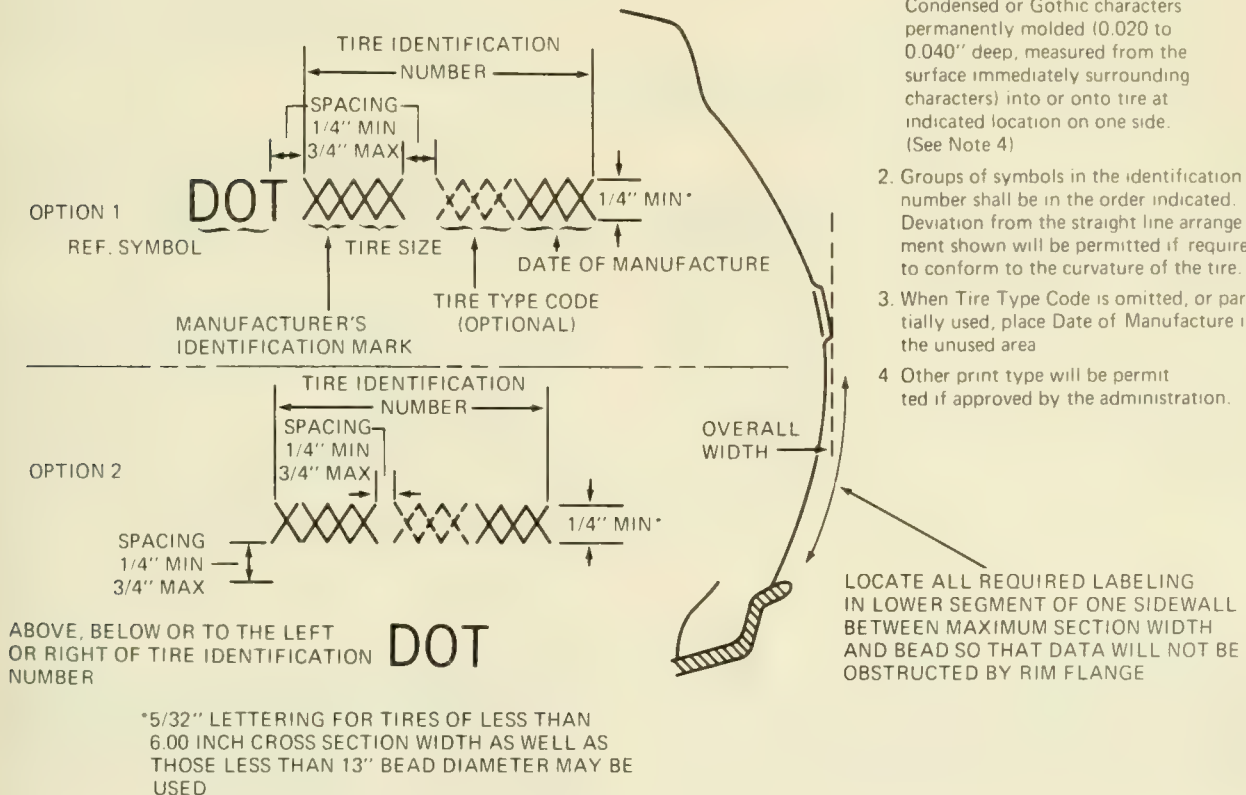
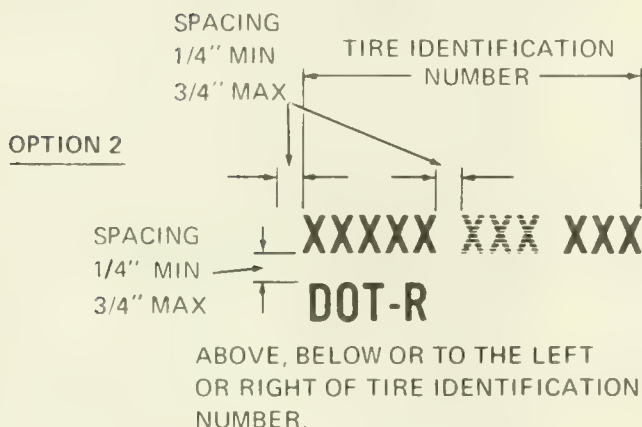
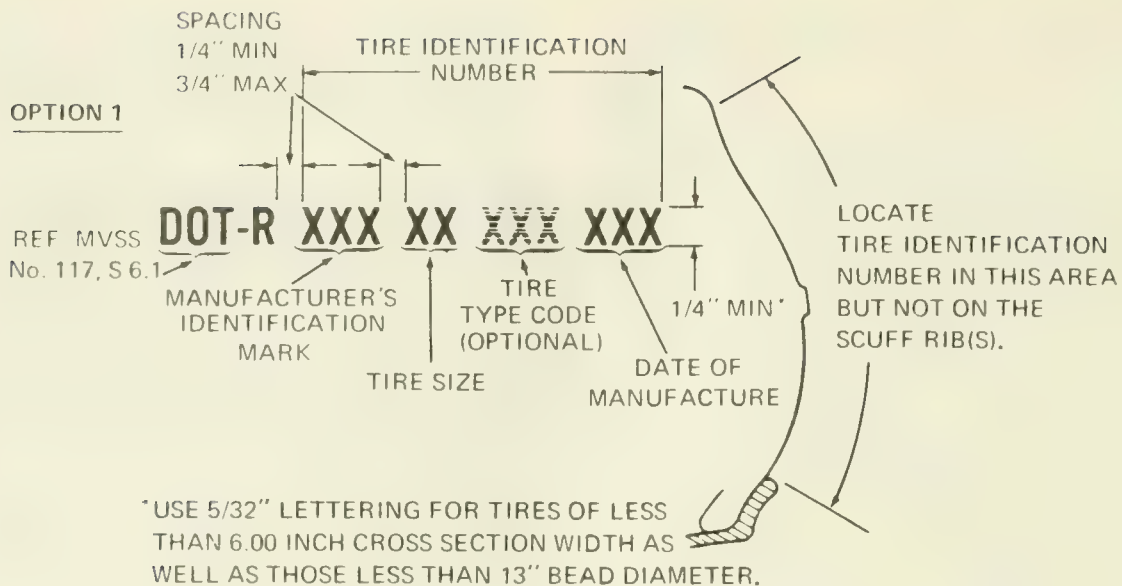


FIGURE 1 - IDENTIFICATION NUMBER FOR NEW TIRES



**NOTES:**

1. Tire identification number shall be in "Futura Bold, Modified, Condensed or Gothic" characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side. (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area.
4. Other print type will be permitted if approved by the Administration.

FIGURE 2 IDENTIFICATION NUMBER FOR RETREADED TIRES

reports have been received from each such distributor or dealer pursuant to paragraph (a) of § 574.8, the total number of tires sold by the tire manufacturer, and the total number of tires for which reports have been received.

(d) Information required by paragraph (a) of this section shall be maintained for a period of not less than 3 years from the date the tire manufacturer or his designee records the information submitted to him.



7 3/8" ± 1/8"

3 1/4" ± 1/8"

IMPORTANT FEDERAL LAW REQUIRES  
TIRE IDENTIFICATION NUMBERS MUST  
BE REGISTERED  
(PLEASE PRINT)

(A) (B)

CUSTOMER'S NAME \_\_\_\_\_ RETURN TO \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

DATE \_\_\_\_\_ FLEET VEHICLE No (OPTIONAL) \_\_\_\_\_

SELLERS NAME AND/OR MANUFACTURER SELLER NUMBER \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

☐ NEW ☐ RETREAD

QTY	TIRE IDENTIFICATION NUMBERS											
	1	2	3	4	5	6	7	8	9	10	11	12

(A) PREPRINTED TIRE MANUFACTURERS' LOGO OR OTHER IDENTIFICATION AND MAILING ADDRESS

(B) MICROFILM NUMBER LOCATION IF NECESSARY

A--B AREAS TO SUIT TIRE MANUFACTURERS REQUIREMENTS

FIG. 3 - UNIVERSAL FORMAT

**§ 574.8 Information requirements—tire distributors and dealers.**

(a) Each distributor and each dealer selling tires to tire purchasers shall submit the information specified in § 574.7 (a) to the manufacturer of the tires sold, or to the manufacturer's designee.

(b) Each tire distributor and each dealer selling tires to tire purchasers shall forward the information specified in § 574.7(a) to the tire manufacturer, or person maintaining the information, not less often than every 30 days. However, a distributor or dealer who sells less than 40 tires, of all makes, types, and sizes during a 30-day period may wait until he sells a total of 40 tires, but in no event longer than 6 months, before forwarding the tire information to the respective tire manufacturers or their designees.

(c) Each distributor and each dealer selling tires to other tire distributors and dealers shall

supply to the tire distributor or dealer to whom he sells tires a means to record the information specified in § 574.7(a), unless such a means has been provided to that distributor or dealer by another person or by a manufacturer.

(d) Each distributor and each dealer shall immediately stop selling any group of tires when so directed by a notification issued pursuant to sections 151 and 152 of the Act (15 U.S.C. 1411 and 1412).

**§ 574.9 Requirements for motor vehicle dealers.**

(a) Each motor vehicle dealer who sells a used motor vehicle for purposes other than resale, or who leases a motor vehicle for more than 60 days, that is equipped with new tires or newly retreaded tires is considered, for purposes of this

part, to be a tire dealer and shall meet the requirements specified in § 574.8.

(b) Each person selling a new motor vehicle to first purchasers for purposes other than resale, that is equipped with tires that were not on the motor vehicle when shipped by the vehicle manufacturer is considered a tire dealer for purposes of this part and shall meet the requirements specified in § 574.8.

#### **§ 574.10 Requirements for motor vehicle manufacturers.**

Each motor vehicle manufacturer, or his designee, shall maintain a record of tires on or in each vehicle shipped by him to a motor vehicle distributor or dealer, and shall maintain a record of the name and address of the first purchaser for purposes other than resale of each vehicle equipped with such tires. These records shall be maintained for a period of not less than 3 years from the date of sale of the vehicle to the first purchaser for purposes other than resale.

#### **INTERPRETATION**

Under section 113(f) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402 (f)) and Part 574, it is the tire manufacturer who has the ultimate responsibility for

maintaining the records of first purchasers. Therefore, it is the tire manufacturer or his designee who must maintain these records. The term "designee," as used in the regulation, was not intended to preclude multiple designees; if the tire manufacturer desires, he may designate more than one person to maintain the required information. Furthermore, neither the Act nor the regulation prohibits the distributor or dealer from being the manufacturer's designee, nor do they prohibit a distributor or dealer from selecting someone to be the manufacturer's designee provided the manufacturer approves of the selection.

With respect to the possibility of manufacturers using the maintained information to the detriment of a distributor or dealer, NHTSA will of course investigate claims by distributors or dealers of alleged misconduct and, if the maintained information is being misused, take appropriate action.

**36 F.R. 4783  
March 12, 1971**

**36 F.R. 13757  
July 24, 1971**

**36 F.R. 16510  
August 21, 1971**

## PREAMBLE TO TIRE CODE MARKS ASSIGNED TO NEW TIRE MANUFACTURERS

The purpose of this notice is to publish the code numbers assigned to new-tire manufacturers under the Tire Identification and Recordkeeping Regulation, 49 CFR Part 574 (36 F.R. 1196).

The Tire Identification and Recordkeeping Regulation (hereafter Part 574) requires that new tires manufactured after May 22, 1971, be marked with a two-symbol manufacturer's code, and that retreaded tires be marked with a three-symbol manufacturer's code. The manufacturer's code is the first grouping within the tire identification number (after the symbol "DOT" or "R" where required).

Under Part 574 a separate code number is assigned to each manufacturer's plant. Table 1 of the notice lists the code numbers assigned and the manufacturer that received each code number. Table 2 lists the same information by

manufacturer. Codes assigned to retreaders will be available for inspection in the Docket Section, Room 5217, 400 Seventh Street SW., Washington, D.C. 20590.

The codes assigned to new-tire manufacturers replace the three-digit code numbers required on new brand-name passenger car tires manufactured prior to May 22, 1971, under Standard No. 109. (The list of numbers assigned under Standard No. 109 was published in the *Federal Register* of July 2, 1968, 34 F.R. 11158.)

Issued on April 14, 1971.

Rodolfo A. Diaz,  
Acting Associate Administrator,  
Motor Vehicle Programs.

**36 F.R. 7539**  
**April 21, 1971**





## PREAMBLE TO TIRE SIZE CODES

The purpose of this notice is to publish an updated list of tire size codes assigned by the National Highway Traffic Safety Administration in accordance with the Tire Identification and Record Keeping regulation, 49 CFR Part 574 (36 F.R. 1196).

The Tire Identification and Record Keeping regulation requires that a tire identification number be placed on new and retreaded tires, and that the second grouping of the number be a code that identifies the tire size or, in the case of a retreaded tire, the tire matrix. New tire manufacturers have up to now been required to use a specific tire size code assigned to the tire size by the NHTSA. Because of the number of new tire sizes being introduced into the market, the possible combinations of letters and numbers have been virtually exhausted.

In order to accommodate new tire sizes the regulation is being amended by notice published elsewhere in this issue (37 F.R. 23727), to allow each tire manufacturer to assign a two-symbol

size code of his own choice, rather than having the number assigned by the agency. However, it is urged that manufacturers maintain the assigned tire size code for existing tire sizes, and that they reuse obsolete tire size codes for new sizes wherever possible.

For convenience of reference, an updated list of the tire size codes assigned by the NHTSA is published below for the information and guidance of tire manufacturers.

This notice is issued under the authority of sections 103, 113, 119, 201 and 1402, 1407, 1421 and 1426; and the delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.

Issued on October 26, 1972.

Robert L. Carter  
Associate Administrator  
Motor Vehicle Programs

**38 F.R. 23742**

**November 8, 1972**





**TABLE 1. LIST OF ALPHA-NUMERIC CODE ASSIGNMENTS TO NEW TIRE MANUFACTURERS**  
**(Based on the following Alpha-numeric code with letters: ABCDEFHJKLMNPTUVWXY**  
**and Nos. 123456789)**

<i>Code No.</i>	<i>New Tire Manufacturers</i>	<i>Code No.</i>	<i>New Tire Manufacturers</i>
AA	The General Tire Co.	DP	The Dunlop Tire & Rubber Corp. (England).
AB	The General Tire Co.	DT	The Dunlop Tire & Rubber Corp. (Australia).
AC	The General Tire Co.	DU	The Dunlop Tire & Rubber Corp. (Australia).
AD	The General Tire Co.	DV	Vredestein (The Netherlands).
AE	The General Tire Co. (Spain).	DW	Vredestein (The Netherlands).
AF	The General Tire Co. (Portugal).	DX	Vredestein Radium (The Netherlands).
AH	The General Tire Co. (Mexico).	DY	Denman Rubber Manufacturing Co.
AJ	Uniroyal, Inc.	EA	Metzeler A.G. (Germany).
AK	Uniroyal, Inc.	EB	Metzeler A.G. (Germany).
AL	Uniroyal, Inc.	EC	Metzeler A.G. (Germany).
AM	Uniroyal, Inc.	ED	Okamoto Riken Gomu Co., Ltd. (Japan).
AN	Uniroyal, Inc.	EE	Nitto Tire Co., Ltd. (Japan).
AP	Uniroyal, Inc.	EF	Hung Ah Tire Co., Ltd. (Korea).
AT	Avon Rubber Co. (England).	EH	Bridgestone Tire Co., Ltd. (Japan).
AU	Uniroyal, Ltd. (Canada).	EJ	Bridgestone Tire Co., Ltd. (Japan).
AV	The Sieberling Tire & Rubber Co.	EK	Bridgestone Tire Co., Ltd. (Japan).
AW	Samson Tire & Rubber Co., Ltd. (Israel).	EL	Bridgestone Tire Co., Ltd. (Japan).
AX	Phoenix Gummiwerke A.G. (Germany).	EM	Bridgestone Tire Co., Ltd. (Japan).
AY	Phoenix Gummiwerke A.G. (Germany).	EN	Bridgestone Tire Co., Ltd. (Japan).
BA	The B. F. Goodrich Co.	EP	Bridgestone Tire Co., Ltd. (Japan).
BB	The B. F. Goodrich Co.	ET	Sumitomo Rubber Industries, Ltd. (Japan).
BC	The B. F. Goodrich Co.	EU	Sumitomo Rubber Industries, Ltd. (Japan).
BD	The B. F. Goodrich Co.	EV	Kleber-Colombes Co. (France).
BE	The B. F. Goodrich Co.	EW	Kleber-Colombes Co. (France).
BF	The B. F. Goodrich Co.	EX	Kleber-Colombes Co. (France).
BH	The B. F. Goodrich Co. (Canada).	EY	Kleber-Colombes Co. (France).
BJ	The B. F. Goodrich Co. (Germany).	FA	The Yokohama Rubber Co., Ltd. (Japan).
BK	The B. F. Goodrich Co. (Brazil).	FB	The Yokohama Rubber Co., Ltd. (Japan).
BL	The B. F. Goodrich Co. (Colombia).	FC	The Yokohama Rubber Co., Ltd. (Japan).
BM	The B. F. Goodrich Co. (Australia).	FD	The Yokohama Rubber Co., Ltd. (Japan).
BN	The B. F. Goodrich Co. (Philippines).	FE	The Yokohama Rubber Co., Ltd. (Japan).
BP	The B. F. Goodrich Co. (Iran).	FF	Michelin Tire Corp. (France).
BT	Semperit Gummiwerke A.G. (Austria).	FH	Michelin Tire Corp. (France).
BU	Semperit Gummiwerke A.G. (Ireland).	FJ	Michelin Tire Corp. (France).
BV	IRI International Rubber Co.	FK	Michelin Tire Corp. (France).
BW	The Gates Rubber Co.	FL	Michelin Tire Corp. (France).
BX	The Gates Rubber Co.	FM	Michelin Tire Corp. (France).
BY	The Gates Rubber Co.	FN	Michelin Tire Corp. (France).
CA	The Mohawk Rubber Co.	FP	Michelin Tire Corp. (Algeria).
CB	The Mohawk Rubber Co.	FT	Michelin Tire Corp. (Germany).
CC	The Mohawk Rubber Co.	FU	Michelin Tire Corp. (Germany).
CD	Alliance Tire & Rubber Co., Ltd. (Israel).	FV	Michelin Tire Corp. (Germany).
CE	The Armstrong Rubber Co.	FW	Michelin Tire Corp. (Germany).
CF	The Armstrong Rubber Co.	FX	Michelin Tire Corp. (Belgium).
CH	The Armstrong Rubber Co.	FY	Michelin Tire Corp. (The Netherlands).
CJ	Inoue Rubber Co., Ltd. (Japan).	HA	Michelin Tire Corp. (Spain).
CK	Not assigned.	HB	Michelin Tire Corp. (Spain).
CL	Not assigned.	HC	Michelin Tire Corp. (Spain).
CM	Continental Gummiwerke A.G. (Germany).	HD	Michelin Tire Corp. (Italy).
CN	Continental Gummiwerke A.G. (France).	HE	Michelin Tire Corp. (Italy).
CP	Continental Gummiwerke A.G. (Germany).	HF	Michelin Tire Corp. (Italy).
CT	Continental Gummiwerke A.G. (Germany).	HH	Michelin Tire Corp. (Italy).
CU	Continental Gummiwerke A.G. (Germany).	HJ	Michelin Tire Corp. (United Kingdom).
CV	The Armstrong Rubber Co.	HK	Michelin Tire Corp. (United Kingdom).
CW	The Toyo Rubber Industry Co., Ltd. (Japan).	HL	Michelin Tire Corp. (United Kingdom).
CX	The Toyo Rubber Industry Co., Ltd. (Japan).	HM	Michelin Tire Corp. (United Kingdom).
CY	McCreary Tire & Rubber Co.	HN	Michelin Tire Corp. (Canada).
DA	The Dunlop Tire & Rubber Corp.	HP	Michelin Tire Corp. (South Vietnam).
DB	The Dunlop Tire & Rubber Corp.	HT	CEAT (Italy).
DC	The Dunlop Tire & Rubber Corp. (Canada).	HU	CEAT (Italy).
DD	The Dunlop Tire & Rubber Corp. (England).	HV	CEAT (Italy).
DE	The Dunlop Tire & Rubber Corp. (England).	HW	Withdrawn.
DF	The Dunlop Tire & Rubber Corp. (England).	HX	The Dayton Tire & Rubber Co.
DH	The Dunlop Tire & Rubber Corp. (Scotland).	HY	The Dayton Tire & Rubber Co.
DJ	The Dunlop Tire & Rubber Corp. (Ireland).	JA	The Lee Tire & Rubber Co.
DK	The Dunlop Tire & Rubber Corp. (France).	JB	The Lee Tire & Rubber Co.
DL	The Dunlop Tire & Rubber Corp. (France).	JC	The Lee Tire & Rubber Co.
DM	The Dunlop Tire & Rubber Corp. (Germany).	JD	The Lee Tire & Rubber Co.
DN	The Dunlop Tire & Rubber Corp. (Germany).		

<i>Code No.</i>	<i>New Tire Manufacturers</i>	<i>Code No.</i>	<i>New Tire Manufacturers</i>
JE	The Lee Tire & Rubber Co.	NA	The Goodyear Tire & Rubber Co. (Republic of Congo).
JF	The Lee Tire & Rubber Co.	NB	The Goodyear Tire & Rubber Co. (England).
JH	The Lee Tire & Rubber Co.	NC	The Goodyear Tire & Rubber Co. (France).
JJ	The Lee Tire & Rubber Co.	ND	The Goodyear Tire & Rubber Co. (Germany).
JK	The Lee Tire & Rubber Co.	NE	The Goodyear Tire & Rubber Co. (Germany).
JL	The Lee Tire & Rubber Co.	NF	The Goodyear Tire & Rubber Co. (Greece).
JM	The Lee Tire & Rubber Co.	NH	The Goodyear Tire & Rubber Co.
JN	The Lee Tire & Rubber Co.	NJ	The Goodyear Tire & Rubber Co. (Luxembourg).
JP	The Lee Tire & Rubber Co.	NK	The Goodyear Tire & Rubber Co. (India.)
JT	The Lee Tire & Rubber Co.	NL	The Goodyear Tire & Rubber Co. (Indonesia).
JU	The Lee Tire & Rubber Co. (Canada).	NM	The Goodyear Tire & Rubber Co. (Italy).
JV	The Lee Tire & Rubber Co. (Canada).	NN	The Goodyear Tire & Rubber Co. (Jamaica).
JW	The Lee Tire & Rubber Co. (Canada).	NP	The Goodyear Tire & Rubber Co. (Mexico).
JX	Lee Tire & Rubber Co. (Canada).	NT	The Goodyear Tire & Rubber Co. (Peru).
JY	Lee Tire & Rubber Co. (Argentina).	NU	The Goodyear Tire & Rubber Co (Philippines).
KA	Lee Tire & Rubber Co. (Australia).	NV	The Goodyear Tire & Rubber Co. (Scotland).
KB	Lee Tire & Rubber Co. (Australia).	NW	The Goodyear Tire & Rubber Co. (South Africa).
KC	Lee Tire & Rubber Co. (Brazil).	NX	The Goodyear Tire & Rubber Co. (Sweden).
KD	Lee Tire & Rubber Co. (Columbia).	NY	The Goodyear Tire & Rubber Co. (Thailand).
KE	Lee Tire & Rubber Co. (Republic of Congo).	PA	The Goodyear Tire & Rubber Co. (Turkey).
KF	Lee Tire & Rubber Co. (France).	PB	The Goodyear Tire & Rubber Co. (Venezuela).
KH	Lee Tire & Rubber Co. (Germany).	PC	The Goodyear Tire & Rubber Co. (Canada).
KJ	Lee Tire & Rubber Co. (Germany).	PD	The Goodyear Tire & Rubber Co. (Canada).
KK	Lee Tire & Rubber Co. (Greece).	PE	The Goodyear Tire & Rubber Co. (Canada).
KL	Lee Tire & Rubber Co. (Guatemala).	PF	The Goodyear Tire & Rubber Co. (Canada).
KM	Lee Tire & Rubber Co. (Luxembourg).	PH	The Kelly-Springfield Tire Co.
KN	Lee Tire & Rubber Co. (India).	PJ	The Kelly-Springfield Tire Co.
KP	Lee Tire & Rubber Co. (Indonesia).	PK	The Kelly-Springfield Tire Co.
KT	Lee Tire & Rubber Co. (Italy).	PL	The Kelly-Springfield Tire Co.
KU	Lee Tire & Rubber Co. (Jamaica).	PM	The Kelly-Springfield Tire Co.
KV	Lee Tire & Rubber Co. (Mexico).	PN	The Kelly-Springfield Tire Co.
KW	Lee Tire & Rubber Co. (Peru).	PP	The Kelly-Springfield Tire Co.
KX	Lee Tire & Rubber Co. (Philippines).	PT	The Kelly-Springfield Tire Co.
KY	Lee Tire & Rubber Co. (Scotland).	PU	The Kelly-Springfield Tire Co.
LA	Lee Tire & Rubber Co. (South Africa).	PV	The Kelly-Springfield Tire Co.
LB	Lee Tire & Rubber Co. (Sweden).	PW	The Kelly-Springfield Tire Co.
LC	Lee Tire & Rubber Co. (Thailand).	PX	The Kelly-Springfield Tire Co.
LD	Lee Tire & Rubber Co. (Turkey.)	PY	The Kelly-Springfield Tire Co.
LE	Lee Tire & Rubber Co. (Venezuela.)	TA	The Kelly-Springfield Tire Co.
LF	Lee Tire & Rubber Co. (England).	TB	The Kelly-Springfield Tire Co. (Argentina).
LH	Uniroyal, Inc. (Australia).	TC	The Kelly-Springfield Tire Co. (Australia).
LJ	Uniroyal, Inc. (Belgium).	TD	The Kelly-Springfield Tire Co. (Australia).
LK	Uniroyal, Inc. (Columbia).	TE	The Kelly-Springfield Tire Co. (Brazil).
LL	Uniroyal, Inc. (France).	TF	The Kelly-Springfield Tire Co. (Colombia).
LM	Uniroyal, Inc. (Germany).	TH	The Kelly-Springfield Tire Co. (Republic of Congo).
LN	Uniroyal, Inc. (Mexico).	TJ	The Kelly-Springfield Tire Co. (England).
LP	Uniroyal, Inc. (Scotland).	TK	The Kelly-Springfield Tire Co. (France).
LT	Uniroyal, Inc. (Turkey).	TL	The Kelly-Springfield Tire Co. (Germany).
LU	Uniroyal, Inc. (Venezuela).	TM	The Kelly-Springfield Tire Co. (Germany).
LV	Mansfield-Denman-General Co., Ltd. (Canada).	TN	The Kelly-Springfield Tire Co. (Greece).
LW	Trelleborg Rubber Co., Inc. (Sweden).	TP	The Kelly-Springfield Tire Co. (Guatemala).
LX	Mitsuboshi Belting, Ltd. (Japan).	TT	The Kelly-Springfield Tire Co. (Luxembourg).
LY	Mitsuboshi Belting, Ltd. (Japan).	TU	The Kelly-Springfield Tire Co. (India).
MA	The Goodyear Tire & Rubber Co.	TV	The Kelly-Springfield Tire Co. (Indonesia).
MB	The Goodyear Tire & Rubber Co.	TW	The Kelly-Springfield Tire Co. (Italy).
MC	The Goodyear Tire & Rubber Co.	TX	The Kelly-Springfield Tire Co. (Jamaica).
MD	The Goodyear Tire & Rubber Co.	TY	The Kelly-Springfield Tire Co. (Mexico).
ME	The Goodyear Tire & Rubber Co.	UA	The Kelly-Springfield Tire Co. (Peru).
MF	The Goodyear Tire & Rubber Co.	UB	The Kelly-Springfield Tire Co. (Philippines).
MH	The Goodyear Tire & Rubber Co.	UC	The Kelly-Springfield Tire Co. (Scotland).
MJ	The Goodyear Tire & Rubber Co.	UD	The Kelly-Springfield Tire Co. (South Africa).
MK	The Goodyear Tire & Rubber Co.	UE	The Kelly-Springfield Tire Co. (Sweden).
ML	The Goodyear Tire & Rubber Co.	UF	The Kelly-Springfield Tire Co. (Thailand).
MM	The Goodyear Tire & Rubber Co.	UH	The Kelly-Springfield Tire Co. (Turkey).
MN	The Goodyear Tire & Rubber Co.	UJ	The Kelly-Springfield Tire Co. (Venezuela).
MP	The Goodyear Tire & Rubber Co.	UK	The Kelly-Springfield Tire Co. (Canada).
MT	The Goodyear Tire & Rubber Co.	UL	The Kelly-Springfield Tire Co. (Canada).
MU	The Goodyear Tire & Rubber Co. (Argentina)	UM	The Kelly-Springfield Tire Co. (Canada).
MV	The Goodyear Tire & Rubber Co., (Australia)	UN	The Kelly-Springfield Tire Co. (Canada).
MW	The Goodyear Tire & Rubber Co. (Australia).	UP	Copper Tire & Rubber Co.
MX	The Goodyear Tire & Rubber Co. (Brazil).		
MY	The Goodyear Tire & Rubber Co. (Colombia).		



<i>Code No.</i>	<i>New Tire Manufacturers</i>
UT _____	Copper Tire & Rubber Co.
UU _____	Carlisle Tire & Rubber Division of Carlisle Corp.
UV _____	Kyowa Rubber Industry Co., Ltd. (Japan).
UW _____	Not assigned.
UX _____	Not assigned.
UY _____	Not assigned.
VA _____	The Firestone Tire & Rubber Co.
VB _____	The Firestone Tire & Rubber Co.
VC _____	The Firestone Tire & Rubber Co.
VD _____	The Firestone Tire & Rubber Co.
VE _____	The Firestone Tire & Rubber Co.
VF _____	The Firestone Tire & Rubber Co.
VH _____	The Firestone Tire & Rubber Co.
VJ _____	The Firestone Tire & Rubber Co.
VK _____	The Firestone Tire & Rubber Co.
VL _____	The Firestone Tire & Rubber Co. (Canada).
VM _____	The Firestone Tire & Rubber Co. (Canada).
VN _____	The Firestone Tire & Rubber Co. (Canada).
VP _____	The Firestone Tire & Rubber Co. (Italy).
VT _____	The Firestone Tire & Rubber Co. (Spain).
VU _____	Withdrawn.
VV _____	The Firestone Tire & Rubber Co. (Sweden).
VW _____	The Firestone Tire & Rubber Co. (Japan).
VX _____	The Firestone Tire & Rubber Co. (England).
VY _____	The Firestone Tire & Rubber Co. (Wales).
WA _____	The Firestone Tire & Rubber Co. (France).
WB _____	The Firestone Tire & Rubber Co. (Costa Rica).
WC _____	The Firestone Tire & Rubber Co. (Australia).
WD _____	The Firestone Tire & Rubber Co. (Switzerland).

<i>Code No.</i>	<i>New Tire Manufacturers</i>
WE _____	Withdrawn.
WF _____	The Firestone Tire & Rubber Co. (Spain).
WH _____	The Firestone Tire & Rubber Co. (Sweden).
WJ _____	The Firestone Tire & Rubber Co. (Australia).
WK _____	Pennsylvania Tire & Rubber Company of Mississippi.
WL _____	The Mansfield Tire & Rubber Co.
WM _____	Olympic Tire & Rubber Co. Pty., Ltd. (Australia).
WN _____	Olympic Tire & Rubber Co Pty., Ltd. (Australia).
WP _____	Schenuit Industries, Inc.
WT _____	Madras Rubber Factory, Ltd. (India).
WU _____	Not Assigned.
WV _____	Not Assigned.
WW _____	Not Assigned.
WX _____	Not Assigned.
WY _____	Not Assigned.
XA _____	Pirelli Tire Corp. (Italy).
XB _____	Pirelli Tire Corp. (Italy).
XC _____	Pirelli Tire Corp. (Italy).
XD _____	Pirelli Tire Corp. (Italy).
XE _____	Pirelli Tire Corp. (Italy).
XF _____	Pirelli Tire Corp. (Spain).
XH _____	Pirelli Tire Corp. (Greece).
XJ _____	Pirelli Tire Corp. (Turkey).
XK _____	Pirelli Tire Corp. (Brazil).
XL _____	Pirelli Tire Corp. (Brazil).
XM _____	Pirelli Tire Corp. (Argentina).
XN _____	Pirelli Tire Corp. (England).
XP _____	Pirelli Tire Corp. (England).
XT _____	Veith-Pirelli A.G. (Germany).



**TABLE 2. LIST OF NEW TIRE MANUFACTURERS AND CORRESPONDING  
IDENTIFICATION CODE MARKS**

**(Based on the following Alpha-numeric code with letters:  
ABCDEFHJKLMNPZTVWXY and Nos. 123456789)**

<i>Manufacturer</i>	<i>Identification code</i>	<i>Manufacturer</i>	<i>Identification code</i>
Alliance Tire & Rubber Co., Ltd.	CD.	The Lee Tire & Rubber Co. ....	JA, JB, JC, JD, JE, JF, JH, JJ, JK, JL, JM, JN, JP, JT, JU, JV, JW, JX, JY, KA, KB, KC, KD, KE, KF, KH, KJ, KK, KL, KM, KN, KP, KT, KU, KV, KW, KX, KY, LA, LB, LC, LD, LE, LF.
The Armstrong Rubber Co. ....	CE, CF, CH, CV.	Madras Rubber Factory, Ltd. ....	WT.
Avon Rubber Co. ....	AT.	The Mansfield Tire & Rubber Co.	WL.
Bridgestone Tire Co., Ltd. ....	EH, EJ, EK, EL, EM, EN, EP.	Mansfield-Deman-General Co., Ltd.	LV.
Carlisle Tire & Rubber Division of Carlisle Corp.	UU.	McCreary Tire & Rubber Co. ....	CY.
Ceat. ....	HT, HU, HV.	Metzeler A.G. ....	EA, EB, EC.
Continental A.G. ....	CM, CN, CP, CT, CU.	Michelin Tire Corp. ....	FF, FH, FJ, FK, FL, FM, FN, FP, FT, FU, FV, FW, FX, FY, HA, HB, HC, HD, HE, HF, HH, HJ, HK, HL, HM, HN, HP.
Copper Tire & Rubber Co. ....	UP, UT.	Mitsuboshi Belting, Ltd. ....	LX, LY.
The Dayton Tire & Rubber Co. ....	HX, HY.	The Mohawk Rubber Co. ....	CA, CB., CC
Denman Rubber Manufacturing Co.	DY.	Nitto Tire Co., Ltd. ....	EE.
The Dunlap Tire & Rubber Co. ....	DA, DB, DC, DD, DE, DF, DH, DJ, DK, DL, DM, DN, DP, DU.	Okamoto Riken Gumo Co., Ltd.	ED.
The Firestone Tire & Rubber Co. ....	VA, VB, VC, VD, VE, VF, VH, VJ, VK, VL, VM, VN, VP, VT, VV, VW, VX, VY, WA, WB, WC, WD, WF, WH, WJ.	Olympic Tire & Rubber Co. Pty., Ltd.	WM, WN.
The Gates Rubber Co. ....	BW, BX, BY.	Pennsylvania Tire & Rubber Company of Mississippi.	WK.
The General Tire & Rubber Co. ....	AA, AB, AC, AD, AE, AF, AH.	Phoenix Gummiwerke A.G. ....	AX AY.
The B. F. Goodrich Co. ....	BA, BB, BC, BD, BE, BF, BH, BJ, BK, BL, BM, BN, BP.	Pirelli Tire Corp. ....	XA, XB, XC, XD, XE, XF, XH, XJ, XK, XL, XM, XN, XP.
The Goodyear Tire & Rubber Co.	MA, MB, MC, MD, ME, MF, MH, MJ, MK, ML, MM, MN, MP, MT, MU, MV, MW, MX, MY, NA, NB, NC, ND, NE, NF, NH, NJ, NK, NL, NM, NN, NP, NT, NU, NV, NW, NX, NY, PA, PB, PC, PD, PE, PF.	Samson Tire & Rubber Co., Ltd.	AW.
Hung Ah Tire Co., Ltd. ....	EF	Schenuit Industries, Inc. ....	WP.
IRI International BV. Rubber Co.	BV	The Seiberling Tire & Rubber Co.	AV.
Inoue Rubber Co., C.J. Ltd. ....	CJ	Semperit Gummiwerke A.G. ....	BT, BU.
The Kelly-Springfield Tire Co. ....	PH, PJ, PK, PL, PM, PN, PP, PT, PU, PV, PW, PX, PY, TA, TB, TC, TD, TE, TF, TH, TJ, TK, TL, TM, TN, TP, TT, TU, TV, TW, TX, TY, UA, UB, UC, UD, UE, UF, UH, UJ, UK, UL, UM, UN.	Sumitomo Rubber Industries. ....	ET. EU.
Kleber-Colombes Co. ....	EV, EW, EX, EY.	The Toyo Rubber Industry Co., Ltd.	CW, CX.
Kyowa Rubber Ind. Co., Ltd. ....		Trelleborg Rubber Co. ....	LW.
		Uniroyal Inc. ....	AJ, AK, AM, AN, AP, AU, LH, LJ, LK, LL, LM, LN, LP, LT, LU.
		Veith-Pirelli A.G. ....	XT.
		Vredestein. ....	DV, DW.
		Vredestein-Radium. ....	DX.
		The Yokohama Rubber Co., Ltd.	FA, FB, FC, FD, FE.

**TABLE 3. TIRE SIZE CODES**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
AA	4.00-4	B7	5.00 R 12	D4	6.00 R 13
AB	3.50-4	B8	5.20-12	D5	6.2-13
AC	3.00-5	B9	5.20-12 LT	D6	6.20-13
AD	4.00-5	CA	5.20 R 12	D7	6.40-13
AE	3.50-5	CB	5.30-12	D8	6.40-13 LT
AF	6.90-6	CC	5.50-12	D9	6.40 R 13
AH	3.00-8	CD	5.50-12 LT	EA	6.50-13
AJ	3.50-6	CE	5.50 R 12	EB	6.50-13 LT
AK	4.10-6	CF	5.60-12	EC	6.50-13 ST
AL	4.50-6	CH	5.60-12 LT	ED	6.50 R 13
AM	5.30-6	CJ	5.60 R 12	EE	6.70-13
AN	6.00-6	CK	5.9-12	EF	6.70-13 LT
AP	3.25-8	CL	5.90-12	EH	6.70 R 13
AT	3.50-8	CM	6.00-12	EJ	6.9-13
AU	3.00-7	CN	6.00-12 LT	EK	6.90-13
AV	4.00-7	CP	6.2-12	EL	7.00-13
AW	4.80-7	CT	6.20-12	EM	7.00-13 LT
AX	5.30-7	CU	6.90-12	EN	7.00 R 13
AY	5.00-8	CV	23.5 X 8.5-12	EP	7.25-13
A1	H60-14	CW	125-12	ET	7.25 R 13
A2	4.00-8	CX	125 R 12	EU	7.50-13
A3	4.80-8	CY	125-12/5.35-12	EV	135-13
A4	5.70-8	C1	135-12	EW	135 R 13
A5	16.5 X 6.5-8	C2	135 R 12	EX	135-13/5.65-13
A6	18.5 X 8.5-8	C3	135-12/5.65-12	EY	145-13
A7	CR70-14	C4	145-12	E1	145 R 13
A8	2.75-9	C5	145 R 12	E2	145-13/5.95-13
A9	4.80-9	C6	145-12/5.95-12	E3	150 R 13
BA	6.00-9	C7	155-12	E4	155-13
BB	6.90-9	C8	155 R 12	E5	155 R 13
BC	3.50-9	C9	155-12/6.15-12	E6	155-13/6.15-13
BD	4.00-10	DA	4.80-10	E7	160 R 13
BE	3.00-10	DB	3.25-12	E8	165-13
BF	3.50-10	DC	3.50-12	E9	165 R 13
BH	5.20-10	DD	4.50-12 LT	FA	165-13/6.45-13
BJ	5.20 R 10	DE	5.00-12 LT	FB	165/70 R 13
BK	5.9-10	DF	7.00-12	FC	170 R 13
BL	5.90-10	DH	5.00-13	FD	175-13
BM	6.50-10	DJ	5.00-13 LT	FE	175 R 13
BN	7.00-10	DK	5.00 R 13	FF	175-13/6.95-13
BP	7.50-10	DL	5.20-13	FH	175/70 R 13
BT	9.00-10	DM	5.20 R 13	FJ	185-13
BU	20.5 X 8.0-10	DN	5.50-13	FK	185 R 13
BV	145-10	DP	5.50-13 LT	FL	185-13/7.35-13
BW	145 R 10	DT	5.50 R 13	FM	185/70 R 13
BX	145-10/5.95-10	DU	5.60-13	FN	195-13
BY	4.50-10 LT <sup>2</sup>	DV	5.60-13 LT	FP	195 R 13
B1	5.00-10 LT	DW	5.60 R 13	FT	195/70 R 13
B2	3.00-12	DX	5.90-13	FU	D70-13
B3	4.00-12	DY	5.90-13 LT	FV	B78-13
B4	4.50-12	D1	5.90 R 13	FW	BR78-13
B5	4.80-12	D2	6.00-13	FX	C78-13
B6	5.00-12	D3	6.00-13 LT	FY	7.50-12

<sup>1</sup> The letters "H", "S", and "V" may be included in the tire size designation adjacent to or in place of a dash without affecting the size code for the designation.

<sup>2</sup> As used in this table the letters at the end of the tire size indicate the following: LT—Light Truck, ML—Mining & Logging, MH—Mobile Home, ST—Special Trailer.

**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
F1	140 R 12	J3	175 R 14	L5	E78-14
F2	6.5-13	J4	185-14	L6	ER78-14
F3	185/60 R 13	J5	185 R 14	L7	F78-14
F4	A70-13	J6	185/70 R 14	L8	FR78-14
F5	A78-13	J7	195-14	L9	G78-14
F6	CR78-13	J8	195 R 14	MA	GR78-14
F7	2.25-14	J9	195/70 R 14	MB	H78-14
F8	2.75-14	KA	205-14	MC	HR78-14
F9	3.00-14	KB	205 R 14	MD	J78-14
HA	6.70-14 LT	KC	215-14	ME	JR78-14
HB	165-14 LT	KD	215 R 14	MF	205-14 LT
HC	2.50-14	KE	225-14	MH	G80-24.5
HD	5.00-14 LT	KF	225 R 14	MJ	H80-24.5
HE	5.20-14	KH	620 R 14	MK	7-14.5
HF	5.20 R 14	KJ	690 R 14	ML	8-14.5
HH	5.50-14 LT	KK	AR78-13	MM	9-14.5
HJ	5.60-14	KL	195-14 LT	MN	6.60 R 15
HK	5.90-14	KM	185-14 LT	MP	2.00-15
HL	5.90-14 LT	KN	A80-22.5	MT	2.25-15
HM	5.90 R 14	KP	B80-22.5	MU	2.50-15
HN	6.00-14	KT	C80-22.5	MV	3.00-15
HP	6.00-14 LT	KU	D80-22.5	MW	3.25-15
HT	6.40-14	KV	E80-22.5	MX	5.0-15
HU	6.40-14 LT	KW	F60-14	MY	5.20-15
HV	6.45-14	KX	C60-14	M1	5.5-15
HW	6.50-14	KY	J60-14	M2	5.50-15 L
HX	6.50-14 LT	K1	L60-14	M3	5.50-15 LT
HY	6.70-14	K2	F80-22.5	M4	5.60-15
H1	6.95-14	K3	G80-22.5	M5	5.60 R 15
H2	7.00-14	K4	H80-22.5	M6	5.90-15
H3	7.00-14 LT	K5	J80-22.5	M7	5.90-15 LT
H4	7.00 R 14	K6	A80-24.5	M8	6.00-15
H5	7.35-14	K7	B80-24.5	M9	6.00-15 L
H6	7.50-14	K8	BR78-14	NA	6.00-15 LT
H7	7.50-14 LT	K9	D70-14	NB	6.2-15
H8	7.50 R 14	LA	DR70-14	NC	6.40-15
H9	7.75-14	LB	E70-14	ND	6.40-15 LT
JA	7.75-14 ST	LC	ER70-14	NE	6.40 R 15
JB	8.00-14	LD	F70-14	NF	6.50-15
JC	8.25-14	LE	FR70-14	NH	6.50-15 L
JD	8.50-14	LF	G70-14	NJ	6.50-15 LT
JE	8.55-14	LH	GR70-14	NK	6.70-15
JF	8.85-14	LJ	H70-14	NL	6.70-15 LT
JH	9.00-14	LK	HR70-14	NM	6.70 R 15
JJ	9.50-14	LL	J70-14	NN	6.85-15
JK	135-14	LM	JR70-14	NP	6.9-15
JL	135 R 14	LN	L70-14	NT	7.00-15
JM	135-14/5.65-14	LP	LR70-14	NU	7.00-15 L
JN	145-14	LT	C80-24.5	NV	7.00-15 LT
JP	145 R 14	LU	D80-24.5	NW	7.10-15
JT	145-14/5.95-14	LV	E80-24.5	NX	7.10-15 LT
JU	155-14	LW	F80-24.5	NY	7.35-15
JV	155 R 14	LX	G77-14	N1	7.50-15
JW	155-14/6.15-14	LY	B78-14	N2	7.60-15
JX	155/70 R 14	L1	C78-14	N3	7.60 R 15
JY	165-14	L2	CR78-14	N4	7.75-15
J1	165 R 14	L3	D78-14	N5	7.75-15 ST
J2	175-14	L4	DR78-14	N6	8.00-15



**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
N7	8.15-15	T9	205/70 R 14	WB	11.00-15
N8	8.20-15	UA	215/70 R 14	WC	2.25-16
N9	8.25-15	UB	H60-15	WD	2.50-16
PA	8.25-15 LT	UC	E60-15	WE	3.00-16
PB	8.45-15	UD	F60-15	WF	3.25-16
PC	8.55-15	UE	FR60-15	WH	3.50-16
PD	8.85-15	UF	G60-15	WJ	5.00-16
PE	8.90-15	UH	GR60-15	WK	5.10-16
PF	9.00-15	UJ	J60-15	WL	5.50-16 LT
PH	9.00-15 LT	UK	L60-15	WM	6.00-16
PJ	9.15-15	UL	4.60-15	WN	6.00-16 LT
PK	10-15	UM	2.75-15	WP	6.50-16
PL	10.00-15	UN	2.50-9	WT	6.50-16 LT
PM	7.50-15 LT	UP	2.50-10	WU	6.70-16
PN	7.00-15 TR	UT	5.00-9	WV	7.00-16
PP	8.25-15 TR	UU	6.7-10	WW	7.00-16 LT
PT	9.00-15 TR	UV	C70-15	WX	7.50-16
PU	7.50-15 TR	UW	D70-15	WY	7.50-16 LT
PV	125-15	UX	DR70-15	W1	8.25-16
PW	125 R 15	UY	E70-15	W2	9.00-16
PX	125-15/5.35-15	U1	ER70-15	W3	10-16
PY	135-15	U2	F70-15	W4	8.25-16 LT
P1	135 R 15	U3	FR70-15	W5	9.00-16 LT
P2	135-15/5.65-15	U4	G70-15	W6	11.00-16
P3	145-15	U5	GR70-15	W7	19-400 C
P4	145 R 15	U6	H70-15	W8	165-400
P5	145-15/5.95-15	U7	HR70-15	W9	235-16
P6	155-15	U8	J70-15	XA	185-16
P7	155 R 15	U9	JR70-15	XB	19-400 LT
P8	155-15/6.35-15	VA	K70-15	XC	G45C-16
P9	165-15	VB	KR70-15	XD	E50C-16
TA	165-15 LT	VC	L70-15	XE	F50C-16
TB	165 R 15	VD	LR70-15	XF	7.00-16 TR
TC	175-15	VE	17-400 TR	XH	7.50-16 TR
TD	175 R 15	VF	185-300 TR	XJ	8.00-16.5
TE	175-15/7.15-15	VH	185-300 LT	XK	8.75-16.5
TF	175/70 R 15	VJ	AR78-15	XL	9.50-16.5
TH	180-15	VK	BR78-15	XM	10-16.5
TJ	185-15	VL	C78-15	XN	12-16.5
TK	185 R 15	VM	D78-15	XP	185 R 16
TL	185/70 R 15	VN	E78-15	XT	4.50-17
TM	195-15	VP	ER78-15	XU	2.00-17
TN	195 R 15	VT	F78-15	XV	2.25-17
TP	205-15	VU	FR78-15	XW	2.50-17
TT	205 R 15	VV	G78-15	XX	2.75-17
TU	215-15	VW	GR78-15	XY	3.00-17
TV	215 R 15	VX	H78-15	X1	3.25-17
TW	225-15	VY	HR78-15	X2	3.50-17
TX	225 R 15	V1	J78-15	X3	6.50-17
TY	235-15	V2	JR78-15	X4	6.50-17 LT
T1	235 R 15	V3	L78-15	X5	7.00-17
T2	J80-24.5	V4	LR78-15	X6	7.50-17
T3	ER60-15	V5	N78-15	X7	8.25-17
T4	D78-13	V6	17-15 (17-380 LT)	X8	7.50-17 LT
T5	A78-15	V7	17-400 LT	X9	225/70 R 14
T6	DR70-13	V8	11-15	YA	G50C-17
T7	HR60-15	V9	11-16	YB	H50C-17
T8	E60-14	WA	L84-15	YC	195/70 R 15

TABLE 3. TIRE SIZE CODES—Continued

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
YD	4.20-18	2F	9.00-20	4J	13.5-24.5
YE	8-17.5 LT	2H	9.4-20	4K	7.00-20 ML
YF	11-17.5	2J	10.00-20	4L	7.50-20 ML
YH	7-17.5	2K	10.3-20	4M	8.25-20 ML
YJ	8-17.5	2L	11.00-20	4N	9.00-20 ML
YK	8.5-17.5	2M	11.1-20	4P	10.00-20 ML
YL	9.5-17.5	2N	11.50-20	4T	10.00-22 ML
YM	10-17.5	2P	11.9-20	4U	10.00-24 ML
YN	14-17.5	2T	12.00-20	4V	11.00-20 ML
YP	9-17.5	2U	12.5-20	4W	11.00-22 ML
YT	205/70 R 15	2V	13.00-20	4X	11.00-24 ML
YU	2.25-18	2W	14.00-20	4Y	11.00-25 ML
YV	2.50-18	2X	6.50-20 LT	41	12.00-20 ML
YW	2.75-18	2Y	7.00-20 LT	42	12.00-21 ML
YX	3.00-18	21	13/80-20	43	12.00-24 ML
YY	3.25-18	22	14/80-20	44	12.00-25 ML
Y1	3.50-18	23	2.75-21	45	13.00-20 ML
Y2	4.00-18	24	3.00-21	46	13.00-24 ML
Y3	4.50-18	25	2.50-21	47	13.00-25 ML
Y4	6.00-18	26	2.75-20	48	14.00-20 ML
Y5	7.00-18	27	10.00-22	49	14.00-21 ML
Y6	7.50-18	28	11.00-22	5A	14.00-24 ML
Y7	8.25-18	29	11.1-22	5B	14.00-25 ML
Y8	9.00-18	3A	11.9-22	5C	10.3-20 ML
Y9	10.00-18	3B	12.00-22	5D	11.1-20 ML
1A	11.00-18	3C	14.00-22	5E	12.5-20 ML
1B	6.00-18 LT	3D	11.50-22	5F	9-22.5 ML
1C	6.00-20 LT	3E	4.10-18	5H	9.4-22.5 ML
1D	L50C-18	3F	4.10-19	5J	10-22.5 ML
1E	7.00-18 LT	3H	7-22.5	5K	10.3-22.5 ML
1F	12-19.5	3J	8-22.5	5L	11-22.5 ML
1H	2.00-19	3K	8.5-22.5	5M	11-24.5 ML
1J	2.25-19	3L	9-22.5	5N	14-17.5 ML
1K	2.50-19	3M	9.4-22.5	5P	15-19.5 ML
1L	2.75-19	3N	10-22.5	5T	15-22.5 ML
1M	3.00-19	3P	10.3-22.5	5U	16.5-19.5 ML
1N	3.25-19	3T	11-22.5	5V	16.5-22.5 ML
1P	3.50-19	3U	11.1-22.5	5W	18-19.5 ML
1T	4.00-19	3V	11.5-22.5	5X	18-22.5 ML
1U	11.00-19	3W	11.9-22.5	5Y	19.5-19.5 ML
1V	9.5-19.5	3X	12-22.5	51	23-23.5 ML
1W	10-19.5	3Y	12.5-22.5	52	18-21 ML
1X	11-19.5	31	15-22.5	53	19.5-21 ML
1Y	7-19.5	32	16.5-22.5	54	23-21 ML
11	7.5-19.5	33	18-22.5	55	6.00-13 ST
12	8-19.5	34	215/70 R 15	56	7.35-14 ST
13	9-19.5	35	225/70 R 15	57	8.25-14 ST
14	14-19.5	36	185/60 R 13	58	7.35-15 ST
15	15-19.5	38	9.00-24	59	8.25-15 ST
16	16.5-19.5	38	10.00-24	6A	12.00-22 ML
17	18-19.5	39	11.00-24	6B	4.30-18
18	19.5-19.5	4A	12.00-24	6C	3.60-19
19	6.00-20	4B	14.00-24	6D	3.00-20
2A	6.50-20	4C	3.50-7	6E	4.25-18
2B	7.00-20	4D	3.00-4	6F	MP90-18
2C	7.50-20	4E	12.5-24.5	6H	3.75-19
2D	8.25-20	4F	11-24.5	6J	MM90-19
2E	8.5-20	4H	12-24.5	6K	3.25-7

**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
6L	2.75-16	8N	2-22½	0T	Not Assigned
6M	4.00-16	8P	2¼-15	0U	BR60-13
6N	7.9	8T	2¼-16	0V	15.00-20
6P	25X 7.50-15	8U	2¼-17	0W	16.00-20
6T	27X 8.50-15	8V	2¼-18	0X	12/80-20
6U	27X 9.50-15	8W	2¼-19	0Y	14/80-24
6V	29X 12.00-15	8X	2¼-19 R	01	15.5/80-20
6W	31X 13.50-15	8Y	2¼-20	02	13-22.5
6X	31X 15.50-15	81	2½-8	03	21-22.5
6Y	C70-14	82	2½-9	04	9/70-22.5
61	Not Assigned	83	2½-16	05	10/70-22.5
62	Not Assigned	84	2½-17	06	11/70-22.5
63	Not Assigned	85	2½-18	07	12/70-22.5
64	Not Assigned	86	2½-19	08	13/70-22.5
65	Not Assigned	87	2½-19 R	09	7.25/75-17.5
66	3.40-5	88	2¾-9	10	8.00/75-17.5
67	4.10-4	89	2¾-16	20	8.75/75-17.5
68	4.10-5	9A	2¾-17	30	9.50/75-17.5
69	175-14 LT	9B	2¾-17 R	40	7.25/75-16.5
7A	11-14	9C	3-10	50	8.00/75-16.5
7B	E78-14 LT	9D	3-12	60	8.75/75-16.5
7C	G78-15 LT	9E	21 x 4	70	9.50/75-16.5
7D	H78-15 LT	9F	22 x 4½	80	6.70-14 C
7E	180 R 15	9H	15.50-20	90	7-17.5 C
7F	185-16 LT	9J	18.50-20	RA	125-12 C
7H	205-16 LT	9K	19.50-20	RB	125-13 C
7J	215-16 LT	9L	2¼-14	RC	125-14 C
7K	F78-16 LT	9M	2½-20	RD	125-15 C
7L	H78-16 LT	9N	2¾-16 R	RE	135-12 C
7M	L78-16 LT	9P	2¾-18	RF	135-13 C
7N	135 R 10	9T	10-20	RH	135-14 C
7P	6.95-14 LT	9U	11-24	RJ	135-15 C
7T	7-14.5 MH	9V	11.25-24	RK	145-10 C
7U	8-14.5 MH	9W	15 x 4½-8	RL	145-12 C
7V	9-14.5 MH	9X	14.75/80-20	RM	145-13 C
7W	4.25/85-18	9Y	23 x 5	RN	145-14 C
7X	A78-14	91	25 x 6	RP	145-15 C
7Y	7.50-18 MPT	92	15 x 4½-8	RT	155-12 C
71	10.5-18 MPT	93	18 x 7-8	RU	155-13 C
72	12.5-18 MPT	94	21 x 8-9	RV	155-14 C
73	12.5-20 MPT	95	23 x 9-10	RW	155-15 C
74	14.5-20 MPT	96	27 x 10-12	RX	A60-13
75	10.5-20 MPT	97	2.00-15 TR	RY	C60-15
76	10.5-20	98	2.50-15 TR	R1	155-16 C
77	8.25-10	99	3.00-15 TR	R2	165-13 C
78	150 R 12	0A	GR60-14	R3	165-16 C
79	150 R 14	0B	560 x 165-11	R4	175-13 C
8A	1¾-19	0C	680 x 180-15	R5	175-15 C
8B	1¾-19¾	0D	8.55-15 ST	R6	175-16 C
8C	2-12	0E	3.50-14	R7	185-13 C
8D	2-16	0F	3.25-14	R8	185-15 C
8E	2-17	0H	3.50-15	R9	195-15 C
8F	2-17 R	0J	AR70-13	A0	195-16 C
8H	2-18	0K	B60-13	B0	205-15 C
8J	2-19	0L	245/60 R 14	C0	215-14 C
8K	2-19 R	0M	255/60 R 15	D0	215-15 C
8L	2-19¾	0N	2¾-15	E0	225-14 C
8M	2-22	0P	2.50-20	F0	225-15 C



**TABLE 3. TIRE SIZE CODES—Continued**

Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>	Tire Size Code	Tire Size Designation <sup>1</sup>
H0	225-16 C	BR	LR60-15	VR	13/80-24
J0	235-14 C	CR	ER60-15	WR	175-16 C
K0	235-15 C	DR	D60-13	XR	195-16 C
L0	235-16 C	ER	C60-13	YR	BR70-13
M0	21-400 C	FR	D60-14	1R	185-15 LT
N0	3.50-20	HR	175/70 R 14	2R	13-22.5 ML
P0	3.75-15	JR	MN90-18	3R	MR70-15
T0	3.60-18	KR	MR90-18	4R	E60-26.5
U0	3.00-10 C	LR	4.25-19	5R	6.7-12
V0	4.00-10 C	MR	230-15	6R	5.4-14
W0	4.00-8 C	NR	5.4-10	7R	7.4-14
X0	4.50-8 C	PR	ER60-13	8R	5.4-16
Y0	265/60 R 14	TR	FR60-14	9R	4.60-18
AR	215/60 R 15	UR	C60C-15		

**36 F.R. 7539  
April 21, 1971**

## PREAMBLE TO PART 575—CONSUMER INFORMATION

### Action on Petitions for Reconsideration—Amendment

Regulations requiring manufacturers of passenger cars and motorcycles to provide information on vehicle stopping distance (§ 375.101), tire reserve load (§ 375.102), and acceleration and passing ability (§ 375.106) were issued by the Federal Highway Administrator and published in the *Federal Register* on January 25, 1969 (34 F.R. 1246). Several petitions for reconsideration of these regulations were received. In response to these petitions, and in order to clarify and simplify the requirements and the information to be provided to purchasers, these regulations are hereby amended and reissued in the form set forth below.

**§ 375.101 Vehicle stopping distance.** This section required that manufacturers state the tire size, type and size of brakes, method of brake actuation and auxiliary brake equipment, and maximum loaded and lightly loaded vehicle weights. The effect of stating these requirements was to greatly restrict the grouping of vehicles and options that was permitted for the purposes of furnishing information. It has been determined that in order to reduce the required number of different information documents, manufacturers should be permitted to group vehicles at their discretion, as long as each vehicle in the group can meet or exceed the performance levels indicated, and the vehicles in each group are identified in the terms by which they are normally described to the public. The requirement for specific descriptive information is therefore deleted.

Since the information must be valid for all vehicles in the group to which it applies, the requirement that it refer to the smallest tire size offered has been found unnecessary, and deleted. It has also been determined that variations in stopping distances between different vehicles at 30 mph are not as meaningful for comparison

purposes as those at 60 mph, and therefore information is required only for the latter speed.

It should be noted that the regulations establish the conditions under which the performance level represented by the information provided can be met or exceeded by every vehicle to which the information applies. They do not establish the procedures by which manufacturers should generate the information, although those procedures are to be inferred from the regulations. For example, both sections contain the condition that wind velocity is zero. This does not mean that manufacturers' tests must be conducted under still air conditions; it means that the performance level established must be attainable by all vehicles in the group under those conditions. One obvious method of satisfying the condition from the manufacturer's standpoint is to conduct verification tests under adverse wind conditions (tailwind for braking, headwind for acceleration). As another example, the condition that ambient temperature be between 32°F and 100°F means that the information presented must be attainable by all vehicles in the group at all temperatures within that range (when other conditions are as stated).

The amended section requires that stopping distances be those attainable without lock-up on any wheel. This condition is the most meaningful from a safety standpoint, since steering control tends to be lost when wheels are locked. Several petitioners submitted data showing minimal differences in maximum and lightly loaded vehicle weight stopping distances to support their request for substitution of a single test weight. Their results, however, were apparently derived from tests conducted with locked wheels, under which conditions stopping distance becomes a function largely of vehicle velocity and the friction coefficient between the tire and the

road, and has no relationship to vehicle weight. It is believed that the condition of no wheel lock-up will result in data showing meaningful differences in stopping distances test weights. Accordingly, the requirement of information covering these two vehicle weight conditions is retained, and petitions on this point are denied.

The section as issued required performance information for a partially failed service brake subsystem ("emergency brake system") only at maximum loaded vehicle weight. It has been determined that in some cases the most adverse condition may occur at lighter loads. The amended rule therefore requires information for "the most adverse combination of maximum or lightly loaded vehicle weight and complete loss of braking in one or the other of the vehicle brake subsystems."

Several petitioners suggested that information be limited to one test weight, instead of requiring it for both lightly loaded and maximum loaded vehicle weight. It has been determined, however, that information on both conditions may reveal vehicles having superior brake balance, and the advantage of anti-skid or load proportioning devices, and also aid purchasers who travel mainly in one or the other of the loading conditions. The petitions to that effect are therefore denied.

**§ 375.102 *Tire reverse load.*** The section required that manufacturers state the number of passengers and the cargo and luggage weight for two different loading conditions, and the actual vehicle weight within a range of no more than 100 pounds under those conditions. These requirements restricted the grouping of vehicles and options that was permitted for the purposes of furnishing information. It has been determined that in order to reduce the required number of different information documents, manufacturers should be permitted to group vehicles by recommended tire size designations regardless of weight, as long as the reserve load figure is met or exceeded by every vehicle in the group. The requirements for providing weight and load-inform information are therefore deleted.

Section 375.102 as issued required that reverse load figures be provided for the vehicle at normal vehicle weight (2 or 3 persons and no luggage) as well as maximum loaded vehicle weight. It also required the furnishing of a "tire over-

load percentage", the percentage difference between the load rating of a tire at recommended inflation pressures for normal vehicle weight and the load on the tire at maximum loaded vehicle weight. Several petitions suggested that the providing of these various percentage figures would tend to confuse persons to whom the information is furnished, and therefore decrease its usefulness to the consumer. Representatives of consumer groups have also suggested, in earlier proceedings concerning the consumer information regulations, that for maximum usability the information should be as simple and clear as possible. In light of these considerations, it has been determined that the tire reserve load figure provided should be limited to a single percentage for each recommended tire size designation, at maximum loaded vehicle weight and the manufacturer's recommended inflation pressure. The requirements for tire reserve load at normal vehicle weight and for tire overload percentage accordingly are deleted.

Two further changes in the calculation methods have been made for simplicity and clarity. Instead of using the actual load on each wheel as the basis for calculation, the wheel load figure is changed to one-half of each axle's share of the maximum loaded vehicle weight. This reflects the method used in Standard No. 110 for determining the vehicle maximum load on the tire. Also, the denominator of the fraction representing the tire reserve load percentage is changed from the load on the wheel to the load rating of the tire. A tire with a load rating of 1500 pounds, for example, used with a wheel load of 900 pounds, would have a reserve load percentage of 40% ( $600/1500 \times 100$ ) rather than 66⅔% ( $600/900 \times 100$ ). The former figure has been determined to be somewhat more meaningful in cases of large reserve loads.

**§ 375.106 *Acceleration and passing ability.*** The section as issued required that times be provided for acceleration from 20 to 35 mph and from 50 to 80 mph, and times and distances for prescribed passing maneuvers involving two lane changes. On the basis of petitions submitted, and further consideration of the need for simplicity and clarity in the information presented, it has been determined that the most useful information would be in the form of passing dis-



tances and times for a simple straight-line passing maneuver at low and high speeds. In order to eliminate the difficulties of conducting a uniform passing maneuver involving a long pace vehicle and a limiting of the passing speed precisely to a specified level, the information required is to be derived on the basis of a time-distance plot of vehicle performance at maximum acceleration from 20 to 35 and 50 to 80 miles per hour.

For reasons discussed above in regard to section 375.101, the requirement of providing the weight of the vehicle is deleted from this section.

Because the amended section does not require information relating to an actual passing maneuver, but only that based on two straight-line acceleration maneuvers with a simple graphic computation, the exception of manufacturers of 500 or fewer vehicles annually from certain of the requirements is removed from this section.

Several petitioners contended that the requirement that information be provided under the condition of full-power operation of a vehicle air conditioner would lead to variable, non-repeatable results. This may be true of the results achieved in manufacturers' tests. The information presented is not, however, to be simply the results of manufacturers' tests, but rather a minimum level of performance that can be met or exceeded by every vehicle to which the information applies. Manufacturers are free, therefore, to adjust the data to account for any variation in results that might be encountered. The degradation of acceleration ability by the use of an air conditioner may be significant in some cases, and therefore it is important from the standpoint of safety that it be reflected in the information provided. The petitions to the contrary are accordingly denied.

Some petitioners objected to the required use of a correction factor to ambient conditions in accordance with SAE Standard J816a, pointing out that the factor was designed to be applicable exclusively to engine dynamometer testing and not to road testing of vehicles. The contention has

been found to have merit. In the section as amended, ranges of ambient conditions of temperature, dry barometric pressure, and relative humidity are provided, and the information is required to be valid at all points within those ranges.

In addition to the above, a new paragraph (c), containing specific definitions, is added to section 375.2, Definitions.

In order to allow adequate time for manufacturers to prepare the information, the three sections are effective for vehicles manufactured on or after January 1, 1970.

In consideration of the above, 49 CFR §§ 375.101, 375.102, and 375.106 are amended, and a new paragraph (c) is added to § 375.2, to read as set forth below. This notice of action on petitions for reconsideration is issued under the authority of sections 112 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1401, 1407) and the delegation of authority by the Secretary of Transportation to the Federal Highway Administrator, 49 CFR 1.4(c).

Issued: May 19, 1969.

F. C. Turner

Federal Highway Administrator

## **SUBPART A—GENERAL**

### **Sec.**

- 375.1 Scope.**
- 375.2 Definitions.**
- 375.3 Matter Incorporated by reference.**
- 375.4 Applicability.**
- 375.5 Separability.**
- 375.6 Requirements.**

## **SUBPART B—CONSUMER INFORMATION ITEMS**

- 375.101 Vehicle Stopping Distance.**
- 375.102 Tire reserve load.**
- 375.103 Reserved.**
- 375.104 Reserved.**
- 375.105 Reserved.**
- 365.106 Acceleration and passing ability.**

May 23, 1969

34 F.R. 8112



**PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION**

Amended regulations concerning the furnishing of consumer information for motor vehicles, 49 CFR §§ 375.101, 102, 106, were published in the *Federal Register* of May 23, 1969 (34 F.R. 8112). Sections 375.101, *Vehicle Stopping Distance*, and 375.106, *Acceleration and Passing Ability*, in subsections (d)(7) and (d)(1)(vii) respectively, specified that the information provided shall be valid for road surfaces with a skid number of 70, as measured in accordance with American Society for Testing and Materials Method E-274 at 40 miles per hour, omitting water delivery as specified in paragraph 7.1 of that Method.

Several petitions for reconsideration have been received, requesting that the skid number condition be set at higher level because there are only a limited number of test tracks presently with surfaces of that low a skid number. It is recognized that the level of 70 may be somewhat lower than many existing test track and road surfaces. It has been determined, in light of the petitions received, that the skid number condition can be set at a somewhat higher level without detracting from the value of the information provided or the enforceability of the regulations. Accordingly, the figure "70" in sections 375.101(d)(7) and 375.106(d)(1)(vii) is hereby changed to "75".

One petitioner requested a delay in the effective date of the regulation because of difficulties in obtaining equipment for the measurement of skid number. In light of the relaxation of the skid number requirement embodied in this notice, and the possibility of temporarily leasing either measuring equipment or test facilities, evidenced by fact that only one such request was received, the request for a delay in effective date is denied.

Since this amendment relaxes a requirement and imposes no additional burden on any person, notice and opportunity for comment thereon are unnecessary and the amendment is incorporated into the above-referenced regulations without change in the effective date. This notice of amendment in response to petitioners for reconsideration is issued under the authority of sections 112 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402, 1407) and the delegation of authority by the Secretary of Transportation to the Federal Highway Administrator, 49 CFR § 1.4(c).

Issued on July 14, 1969.

F. C. Turner  
Federal Highway Administrator

34 F.R. 11974  
July 16, 1969





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

Regulations requiring manufacturers of motor vehicles to provide information to consumers concerning performance characteristics of their vehicles were published on January 25, 1969 (34 F.R. 1246), and amended on May 23, 1969 (34 F.R. 8112). By notice of July 11, 1969 (34 F.R. 11501) it was proposed that the regulations be amended to require manufacturers to provide the information to prospective purchasers, as well as those who have already bought a vehicle, and also to provide the information to the Administrator 30 days before the information is required to be provided to purchasers.

No general objections to the proposed amendment were received. One manufacturer objected to the requirement of providing copies to the Administrator 30 days in advance, on the basis that this did not allow sufficient lead time from the date of the proposal. In light of the fact that the information required to be provided consists only of performance figures that the manufacturer is certain can be exceeded by its vehicles, that the information must be provided in large quantities to dealers by January 1, 1970, and that no other manufacturers evidenced difficulty in meeting the December 1 date, the objection is found not to be meritorious.

The Automobile Manufacturers Association made two suggestions for changes to the regulation, both of which have been accepted and incorporated into the regulation. One change adds language to make it clear that the locations at which the information is to be provided are outlets with which the manufacturer has some legal connection. The other is that the date on which information relating to newly introduced vehicles

is required is the "announcement date", on which dealers are authorized to display and sell the vehicles.

The proposal stated that three copies should be submitted to the Administrator by December 1, 1969. It has been determined that in light of the need for immediate processing and the large amount of information that will be received at that time, a somewhat larger number of copies will be needed. The number of copies has been changed, accordingly, from three to ten. Since the additional burden on automotive manufacturers of providing these copies appears to be insubstantial, a further notice of proposed rule-making is found to be unnecessary. Other minor changes in wording are made for clarity.

*Effective Dates:* Subsections (a) and (b) of § 375.6, Requirements, are effective January 1, 1970. Subsection (c) of that section is effective December 1, 1969.

In light of the foregoing, Subpart A—General, of 49 CFR Part 375 is amended to read as set forth below. This amendment is issued under the authority of sections 112 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1401, 1407), and the delegation of authority from the Secretary of Transportation to the Federal Highway Administration, 49 CFR § 1.4(c).

Issued on October 16, 1969.

E. H. Holmes, Acting  
Federal Highway Administrator

34 F.R. 17108  
October 22, 1969





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

### Motorcycle Brake Burnishing Requirement

On May 23, 1969, the Federal Highway Administration published 49 CFR § 375.101, Vehicle Stopping Distance, of the Consumer Information Regulations (34 F.R. 8112). Paragraph (e)-(1)(ii) of that section, describing the burnishing procedures for motorcycles, is as follows: "Same as for passenger cars, except substitute 30 m.p.h. for 40 m.p.h. and 150° F. for 250° F., and maintain hand lever force to foot lever force ratio of approximately 1 to 2."

A manufacturer has stated that such a burnishing procedure, which was drawn from a draft SAE Recommended Practice, would be inappropriate for its vehicles, and suggests that the required burnishing procedures should be that recommended by the manufacturer. Since it appears that a uniform burnishing procedure suitable for all motorcycles has not yet been developed, the suggestion is found to have merit, to the extent that manufacturers have recommended such procedures. A general burnishing procedure must still be specified, however, for the purpose of determining compliance of those vehicles for which the manufacturers have not made a procedure publicly available. Accordingly, subparagraph (e)(1)(ii) of section 375.101 is hereby amended to read as follows:

*"Motorcycles.* Adjust and burnish brakes in accordance with manufacturer's recommendations. Where no burnishing procedures have been recommended by the manufacturer, follow the procedure specified above for passenger cars, except substitute 30 m.p.h. for 40 m.p.h. and 150° F. and 250° F., and maintain hand lever force to foot lever force ratio of approximately 1 to 2."

The Consumer Information regulations require manufacturers to submit information to the

FHWA by December 2, 1969, and it is important, therefore, that this amendment to the regulations be made effective without delay. The regulations require only that the manufacturers submit information to purchasers (and to the FHWA) as to performance levels that can be met or exceeded by their vehicles, and it is not necessary that vehicles be retested as long as they perform as well under the manufacturers' own burnishing procedures as under the previously specified ones. Manufacturers are, of course, free to provide new performance figures at any time, under the procedures specified in Part 375. If in a particular case a manufacturer determines that its vehicles may not be able to meet the performance figures provided when its own recommended burnishing procedures are utilized, and is not able to provide new and appropriate figures within the time specified, it should include a notation to that effect at the time that the figures are first provided to the FHWA. The vehicles in question will not be considered to be in violation of the regulations if they meet the performance figures provided under the previously specified burnishing procedures, and if new and corrected figures are provided under section 375.101, as amended, not later than September 1, 1970.

Because of the importance of providing to consumers by January 1, 1970, the probability that few if any manufacturers will be adversely affected by the amendment, and the provisions for relief included herein, notice and public procedure thereon are found to be impracticable, unnecessary, and contrary to the public interest, and the amendment described above is made effective on publication in the *Federal Register*.

**Effective: November 26, 1969**

This amendment is issued under the authority of sections 112 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1401, 1407), and the delegation of authority from the Secretary of Transportation to the Federal Highway Administrator, 49 CFR § 1.4(c).

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Issued on November 24, 1969.

F. C. Turner  
Federal Highway Administrator

**34 F.R. 18865**  
**November 26, 1969**

**PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION**  
**(Availability Requirements)**

The purpose of this notice is to amend section 575.6 of the Consumer Information Regulations (49 CFR Part 575) to require that the information supplied pursuant to Subpart B of the Regulations be provided in sufficient quantity to permit retention by prospective customers or mailing to them upon request. A notice of proposed rulemaking was published on January 14, 1971 (36 F.R. 557), proposing to carry out the legislative mandate of P.L. 91-625 (84 Stat. 262). That legislation was designed to remedy difficulties resulting from the current practice of making consumer information available only in the showroom, by permitting the Secretary to require that the information be provided in a printed format which could be retained by customers who visit the showroom or mailed to others upon their request.

A limited number of comments were received in response to the Notice, some of which merely expressed support for the additional requirement. The Chrysler Corporation requested that the amendment be clarified to provide that temporary unavailability would not constitute a failure to comply with the regulations. As is noted in the Notice of proposed rulemaking, the uncertainty of demand makes it difficult to establish precise standards as to what is "sufficient." It has been determined, therefore, that any further specification of this provision would be inappropriate at this time. It is intended that

manufacturers and dealers will cooperate to take all reasonable steps to ensure that a continuous supply of the information is available.

The Chrysler Corporation further requested that the regulation clearly indicate that a reasonable charge can be made for the materials. The legislative history of P.L. 91-625 indicates that a major purpose of the amendment was to make consumer information more easily available to consumers in making their purchase. A charge for consumer information on several makes and models of vehicles could present the car shopper with as great an obstacle to availability of information as is the case with the present system. In view of this purpose and the general aim of the consumer information regulations to provide for as wide a dissemination of information as possible, it has been determined that the retention copies should be provided without charge.

In consideration of the above, 49 CFR 575.6(b) is amended. . . .

*Effective date:* January 1, 1972.

Issued on September 28, 1971.

Douglas W. Toms  
Administrator

**36 F.R. 19310**  
**October 2, 1971**





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

### (Truck-Camper Loading)

(Docket No. 71-7; Notice 5)

This notice reissues the portion of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Trucker-Camper Loading*, that was previously applicable to truck manufacturers as a consumer information regulation, 49 CFR § 575.103, *Truck-Camper Loading*. It also responds to petitions for reconsideration of Standard No. 126 on issues that are not addressed in Notice 4, which is published in this issue (37 F.R. 26605).

Petitions for reconsideration of Standard No. 126 (37 F.R. 16497) were filed by Chrysler Corporation (Chrysler), Ford Motor Company (Ford), General Motors Corporation (GM), Jeep Corporation (Jeep), Motor Vehicle Manufacturers Association (MVMA) Recreational Vehicle Institute, Inc. (RVI) and Toyota Motor Sales USA, Inc. (Toyota).

In response to information contained in some of the petitions, the portions of the standard previously applicable to truck manufacturers are being reissued under this notice as a consumer information regulation for the reasons stated in Notice 4. Minor amendments are also made to the regulation on the basis of some of the petitions while the Administrator has declined to grant requested relief from other requirements of the regulation.

1. *Effective date.* GM has petitioned for a delayed effective date. As a truck manufacturer, GM feels that additional lead time is required "to develop, process, and print the necessary information on an orderly basis." The Administration has found for good cause shown that an effective date earlier than 180 days after issuance of Standard No. 126 was in the public interest; however, to allow truck manufacturers sufficient time for testing to determine cargo

center of gravity locations the effective date of the requirements applicable to truck manufacturers is being extended 2 months, until March 1, 1973.

2. *Definitions and information.* As discussed in Notice 4 Ford objected to the definition of "cargo weight rating" and the term "total load". Standard No. 126 has been amended to meet Ford's objections, and similar changes are made in the terminology of the new truck consumer information regulation.

Ford also suggests that the phrase "any additional weight carried in or on the camper" should be substituted for "the weight of camper cargo, and the weight of passengers in the camper" in paragraph S5.2.1(d) of Standard No. 126, now § 575.103(e)(3). It believes the suggested language would be more meaningful to the average user and that the present language could be construed as endorsing the carrying of passengers in campers. Ford's request is denied. The NHTSA considers that the specificity of references to cargo and passengers is more meaningful to consumers than the general reference to "any additional weight". Further, given the prevalence of carrying passengers in campers, the NHTSA does not believe that the present language can realistically be considered to have a significant effect on this practice.

Both Ford and GM objected to the paragraph requiring the manufacturer to furnish trailer towing recommendations, on the grounds of vagueness and lack of prior notice and opportunity to comment. The NHTSA concurs, and is deleting this requirement.

Ford suggests that paragraph S5.2.1(a) of Standard No. 126 (now § 575.103(e)(1)) should be revised to make clear that the slide-in camper

also has a center of gravity designation determined in accordance with the regulation, which falls within the boundaries specified by the vehicle manufacturer. Since campers manufactured before the effective date of the regulation may be mounted on trucks manufactured after March 1, 1973, Ford's suggestion has not been adopted.

GM has petitioned that a warning be required to accompany the regulation's information, stating that the longitudinal center of gravity is only one of the many factors affecting the overall performance of a vehicle and that other factors concerning vehicle handling should be considered by the operator. The NHTSA denies GM's petition on this point. Proper loading and load distribution in truck-camper combinations is a highly significant handling factor, and such a warning might cause a truck operator to feel the loading information presented is of little significance. The regulation does not, however, prohibit GM or other manufacturers from furnishing such additional warnings if they see fit.

GM has also asked for a confirmation of its assumption that "the pictorial representation of

the recommended longitudinal center of gravity zone for the cargo weight rating need not be to scale but can be generalized so long as the longitudinal boundaries of the zone are clearly set forth." The NHSTA agrees with this interpretation.

*Effective Date:* March 1, 1973.

In consideration of the foregoing, 49 CFR Part 575 is amended by adding a new § 575.103, *Truck-camper Loading*. . . .

This notice is issued pursuant to the authority of sections 112 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on December 6, 1972.

Douglas W. Toms  
Administrator

**37 F.R. 26607**  
**December 14, 1972**



## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

### Truck-Camper Loading

(Docket No. 71-7; Notice 6)

This notice responds to petitions for reconsideration of 49 CFR § 575.103, *Truck-camper loading*, with amendments extending the effective date to April 1, 1973, and allowing optional wording of certain statements until October 1, 1973.

On December 14, 1972, Part 575 of Title 49, Code of Federal Regulations, was amended by adding § 575.103 *Truck-camper loading* (37 F.R. 26607). The amendment was in essence that portion of Federal Motor Vehicle Safety Standard No. 126, *Truck-camper loading* that applied to manufacturers of trucks accommodating slide-in campers, as originally published on August 15, 1972 (37 F.R. 16497). Pursuant to 49 CFR § 553.35, petitions for reconsideration of § 575.103 have been filed by General Motors Corporation and International Harvester Company. Ford Motor Company has asked for a clarification.

In response to information contained in these petitions the regulation is being amended in certain respects, and a new effective date of April 1, 1973 adopted. Requested changes in other requirements of the regulation are denied.

1. *Effective date:* Both petitioners request delay of the effective date of the regulation for at least 60 days, until May 1, 1973 at the earliest. One reason for the request is that petitioners had printed their manuals on the basis of the notice of August 15, 1972, and that the additional time is needed to print new materials conforming to modified texts published on December 14, 1972. General Motors also states that the additional time is needed to prepare and disseminate data in a manner meeting the requirement that it be available to prospective purchasers. While data has been prepared for each truck, it has not yet been consolidated into a single sheet or pamphlet

suitable for showroom display and availability. The requests of both petitioners reflect the probability that the material will not be submitted to the Administrator at least 30 days before it is available to prospective purchasers, as required by § 575.6(c), and the possibility that the data will not be ready by March 1, 1973.

The NHTSA has determined that good cause has been shown for postponement of the effective date until April 1, 1973. This agency recognizes, however, that the minor textual changes made in the December notice create problems of conformity for those manufacturers who in good faith relied on the August notice in ordering materials. Accordingly, the regulation is being amended to allow the earlier wording on an optional basis until October 1, 1973. These amendments permit use of the phrase "total load" instead of "total cargo load" in paragraph (e)(3) where it twice appears, and the legend "Aft End of Cargo Area" for "Rear End of Truck Bed" in Figure 1, Truck Loading Information. The word "rating" appearing on the last line of paragraph (e)(5) is properly "ratings" as printed in the August notice, and a correction is made. Further, the NHTSA considers it important that a manufacturer fulfill the requirements of § 575.6(b) by making information available to prospective purchasers when trucks manufactured on or after April 1, 1973 are placed on sale. Considering the short lead time between December 14, 1972 and February 1, 1973 and the intervening holidays, the NHTSA will not take enforcement action with respect to the furnishing of information under §§ 575.103 and 575.6(c) prior to April 1, 1973, if manufacturers provide information to this agency as required by those sections not later than the date by which the information must be provided to prospective purchasers.

2. *Administrative Procedure Act.* Harvester believes that the Administrative Procedure Act was violated in that interested persons were not provided an opportunity to comment upon providing information under Part 575 prior to enactment of § 575.103. The NHTSA views Harvester's comment as a narrow construction of the requirements of the Act, and disagrees with petitioner's conclusion. The content of § 575.103 was proposed on April 9, 1971 (36 F.R. 6837) and adopted as a safety standard on August 15, 1972 (37 F.R. 16497). Pursuant to petitions for reconsideration from Chrysler Corporation, Ford Motor Company, General Motors, Jeep Corporation, and Motor Vehicle Manufacturers' Association that Standard No. 126 would be more appropriate as a consumer information regulation, the NHTSA adopted § 575.103 on December 14, 1972 with content virtually identical to that issued in the previous August. Thus the agency considers it has met 5 USC § 553 by providing notice of the terms and substance of the rule, and an opportunity to comment. It is true that notice was not provided on the specific issue that distinguishes the consumer information regulation from a motor vehicle safety standard (*i.e.*, availability of information to a prospective purchaser and the agency at specified time periods), but the NHTSA considers this issue a minor one in relation to the regulation as a whole for which adequate notice was given. In view of the weight of comment that the standard should properly be a consumer information regulation, no further notice was deemed necessary. The NHTSA has

already in this notice indicated its willingness to liberally interpret § 575.6(c) because of the time factor involved.

3. *Clarification.* Ford Motor Company has asked for a clarification of the term "weight of occupants" used to compute "cargo weight rating", as defined by the regulation. Specifically, Ford inquires whether the weight is that of a 95th percentile male—that of an "occupant" as defined by § 571.3(b)—or that of a person weighing 150 pounds, the figure applicable to other consumer information regulations and used in the safety standards.

The NHTSA intended "weight of occupants" to be the "normal occupant weight" figure of 150 pounds specified in Motor Vehicle Safety Standard No. 110 rather than that of a 95th percentile male, which is greater. To clarify this, the phrase, "computed as 150 pounds times the number of designated seating positions," is added to the regulation.

In consideration of the foregoing, 49 CFR § 575.103, *Truck-camper loading*, is amended . . .

Effective date: April 1, 1973.

(Sec. 112 and 119, Pub. L. 89-563; 80 Stat. 718, 15 USC 1401, and 1407; delegation of authority at 49 CFR 1.51.)

Issued on February 12, 1973.

Douglas W. Toms  
Administrator

38 F.R. 4400  
February 14, 1973

## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

### Subpart A—General

(Docket No. 73-5; Notice 1)

This notice amends the definition section of the regulation on Federal motor vehicle consumer information reflecting previous amendments to definitions in the Federal motor vehicle safety standards.

The definitions of "brake power unit" and "lightly loaded vehicle weight" in 49 CFR § 575.2(c) have been obsoleted by recent amendments to these terms in Motor Vehicle Safety Standard No. 105a, *Hydraulic Brake Systems* (37 F.R. 17970). "Brake power unit" has been redefined to more accurately describe the characteristics of the component concerned. The term "curb weight" used in defining "lightly loaded vehicle weight" has been replaced by "unloaded vehicle weight" (as defined in § 571.3) as a more precise description of vehicle condition. Finally, "Maximum sustained vehicle speed"

should be grammatically a speed "attainable" rather than "obtainable".

*Effective date:* February 28, 1973. Since these amendments are primarily a matter of form and have no significant effect on substantive requirements, it is found for good cause that notice and public procedure thereon is unnecessary, and an immediate effective date is in the public interest.

(Sec. 112, 119 Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on February 21, 1973.

Douglas W. Toms  
Administrator

38 F.R. 5338  
February 28, 1973





## **PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION**

### **Subpart A—General**

**(Docket 72-24; Notice 2)**

This notice amends 49 CFR 575, Consumer Information, to require manufacturers to identify specially-configured vehicles not available for purchase by the general public as "special vehicles" in the information submitted to the NHTSA under § 575.6(c).

A notice of proposed rulemaking to this effect was published on November 8, 1972 (37 F.R. 23732). As noted in that proposal, inclusion of these vehicles in compilations or rankings published by this agency as consumer information serves no beneficial purpose, and could confuse the consumer.

No comments opposed the proposal. General Motors Corporation commented that the amendment should more clearly indicate that the special vehicle identification requirements only apply to the information supplied to NHTSA under § 575.6(c). The new section reflects this suggestion.

Ford Motor Company agreed with GM that the special vehicle identification is useful in information supplied to NHTSA. Ford also suggested, however, that consumer information on special vehicles need not be included at all in the

information supplied "on location" to prospective purchasers in accordance with § 575.6(b). The NHTSA does not have information at present to support or repudiate this suggestion, which is beyond the scope of the proposal. If Ford or any other person wishes to petition for rulemaking on this subject, the agency will consider it for possible future rulemaking.

In response to an implied question by Truck Body and Equipment Association, Inc., the amendment does not change the applicability of the Consumer Information regulations, as set forth in Subpart B of Part 575.

In consideration of the foregoing, 49 CFR Part 575, Consumer Information, is amended...

Effective date: June 11, 1973.

(Secs. 112, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on May 1, 1973.

James E. Wilson  
Acting Administrator

**38 F.R. 11347**  
**May 7, 1973**





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

(Docket No. 25, Notice 8)

This notice establishes a Consumer Information regulation on Uniform Tire Quality Grading. The notice is based on proposals published March 7, 1973 (38 F.R. 6194), and August 14, 1973 (38 F.R. 21939). An earlier proposal, published September 21, 1971 (36 F.R. 18751) was later withdrawn (April 21, 1972; 37 F.R. 7903). Comments submitted in response to these proposals have been considered in the preparation of this notice.

The regulation will require tire manufacturers and brand name owners to provide relative grading information for 13-, 14- and 15-inch tire size designations for tire traction, treadwear, and high speed performance. The respective grades will be molded into or onto the tire sidewall, contained in a label affixed to each tire, and provided for examination by prospective purchasers in a form retainable by them at each location where tires are sold. The requirements are effective with respect to passenger cars when they are equipped with new tires bearing quality grades.

*Treadwear:* The regulation requires each tire to be graded for treadwear performance using numbers which indicate the percentage of treadwear the tire will produce when compared to the treadwear obtained from a "control tire" specified in the regulation. Each tire will be graded with either the number "60", representing treadwear performance less than 80 percent of the control tire's, or the number "80", "120", "160" or "200", representing at least that percentage of control tire wear. The grades are fewer in number and represent broader performance ranges than those proposed, as a result of comments that the proposed grades were too numerous and would not take into account inherent differences in tire performance.

The method for obtaining treadwear grades is essentially that proposed in the notice of March 7, 1973. Treadwear grades will be determined by using a convoy of up to four identical passenger cars with one vehicle equipped with four identical control tires, and each of the remaining vehicles equipped with four identical manufacturer's tires (candidate tires) having the same nominal rim diameter as the control tire. The NHTSA intends that the convoy vehicles be driven as similarly as possible with respect to such factors as steering and braking. The vehicles are run for 16,000 miles over a surface that will produce control tire wear equal to between 65 and 85 percent of original tread depth. The proposal had suggested that the tires be worn to 90 percent of tread depth. This percentage has been reduced to prevent the tires from being worn below their treadwear indicators. The proposal had further suggested that candidate tires be loaded to 100 percent of the load specified for their inflation pressure in the 1972 Tire and Rim Association Yearbook. In response to comments that vehicles are rarely loaded to that extent in practice, the load has been changed to 90 percent of the load specified for the inflation pressure in the 1972 Tire and Rim Association Yearbook. The NHTSA believes the road test method for measuring treadwear to be the most satisfactory that is presently available. Moreover, the method has been used for many years by tire manufacturers to evaluate the treadwear potential of newly developed tire designs and compounds.

Many comments agreed that a 16,000-mile road test was appropriate for grading the treadwear of radial tires. Some comments urged, however, that only a 12,000-mile test be specified for bias and bias/belted tires. The NHTSA has

not accepted this recommendation as it believes the comparative data for candidate tires of different construction types will necessarily be more accurate if the comparisons are based on the same degree of control tire wear.

Certain comments referred to the existing national energy shortage, requesting that the agency take into account the problems presented by the shortage in the final requirements. The NHTSA recognizes the degree of energy that will be necessary to perform the appropriate grading tests, particularly with respect to the test for treadwear grading. Research has been undertaken and will continue with a view to reducing the energy needs to establish treadwear performance without adversely affecting the validity of test results. The NHTSA invites suggestions or proposals in this regard, including supportive data, directed to the establishment of alternative methods or tests for grading tire treadwear.

*Traction:* Each tire will bear a traction grade of "90", "105", or "120", representing at least that percentage of control tire performance. The test for obtaining traction grades is similar to that proposed on March 7, 1973. It utilizes a two-wheeled test trailer built essentially to specifications in American Society of Testing and Materials E-274-70, *Skid Resistance of Paved Surfaces Using a Full-Scale Tire*. The test consists of towing the trailer over specified wet test surfaces, equipped first with identical control tires, and then with identical candidate tires of the same rim diameter as the control tire. The average coefficient of friction is computed when one trailer wheel is locked on each of the two surfaces at 20, 40, and 60 miles per hour. The grade, similarly to the treadwear grade, is the comparative difference between candidate and control tire performance. The final rule differs from the notice in that the proposed traction grade representing less than 90 percent of control tire performance has not been included. This results from the notice proposing to amend Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) (38 F.R. 31841; November 19, 1973) to require all passenger car tires to achieve at least this level of control tire performance. The NHTSA expects that this requirement will become effective on the effective date of this

regulation, thereby necessitating the deletion of the grade. The other grades specified differ from those proposed to the extent that the range between grades has been increased to better allow for inherent gradations in actual tire performance.

Many comments urged that grading for tire traction not be established at this time. The comments argued that the current state of the art has not advanced to the point where reliable and reproducible results can be obtained using the proposed two-wheel trailer method.

The NHTSA believes the traction test issued by this notice, utilizing the two-wheeled trailer, is an objective procedure, capable of producing repeatable results, and is therefore satisfactory for the purpose of measuring and grading straight-line, wet-surface braking traction. In this regard, on the basis of information received from General Motors, that company is presently using the identical methodology in the specifications for tire traction for its "TPC" specification tire. This tire is presently manufactured by numerous domestic tire companies. Moreover, grading tire traction is a necessary adjunct, in the view of NHTSA, to grading tire treadwear, for it is commonly known that treadwear and traction performance result from diverse tire properties. The two tests, therefore, serve as a check that manufacturers will not design tires that perform well in one area at the expense of performance in the other. The minimum traction performance requirement recommended by the comments as a substitute for traction grading is insufficient, in the view of NHTSA, to serve this function alone.

Many comments stated that traction test surfaces should be defined by test surface composition and skid number, rather than by skid number alone as proposed. It was argued that without a surface specification, reversals in tire performance may occur. The NHTSA agrees that the inclusion of precise surface specifications may improve the reliability of traction test results. It has not adopted such specifications in this notice as they have not been previously proposed. However, recent developments have been made in the establishment of test surfaces by the Federal Highway Administration of the Department of Transportation. Test surfaces developed



by that agency are proposed in a notice issued concurrently with this notice (1061) for later inclusion in the regulation.

Some comments argued that the description of this grading parameter as "traction" was misleading, as the proposed test dealt only with wet braking traction and not dry pavement or cornering traction. They suggested therefore that the grading parameter be referred to as braking or stopping traction, or as "wet-surface traction." The NHTSA does not dispute that these other traction properties are important aspects of tire traction, and expects to add these performance aspects to the traction grading scheme when appropriate test procedures are developed. The NHTSA does not believe, however, that the description of the existing test as "traction" is misleading. The terminology suggested by the comments, in the view of NHTSA, would be over technical and unnecessary.

*High speed performance:* High speed performance grades of "A", "B", or "C" are required to be affixed to each tire based on its performance on the high speed laboratory test wheel which is presently used in testing for conformity to Motor Vehicle Safety Standard No. 109. The test utilized is as proposed—an extension of the Standard No. 109 high speed performance test. A tire will be graded "C" if it only passes the Standard No. 109 test. In order to achieve a grade of "B", the tire must run without failure an additional ½ hour at 425 rpm and two additional hours, one at 450 rpm and the other at 475 rpm. To achieve a grade of "A" the tire must be run without failure an additional hour at 500 rpm and another hour at 525 rpm. The NHTSA has recently revised the criteria for tire failure in Standard No. 109 (38 F.R. 27050; September 28, 1973) and the revised criteria are the criteria included in this rule.

The principal comment regarding the proposed high speed grading format was that it should consist of only two grades—one recommended for general use and the other for use by emergency vehicles. The comments argued that further grading of high speed performance was unnecessary and would promote high speed driving. The NHTSA views the suggested 2-grade scheme as rendering any high speed grade meaningless for most consumers. Essentially, it pro-

vides no information other than conformity to Standard No. 109. The NHTSA believes driving habits with respect to speed do differ among the driving population and that the grading scheme should be based on that consideration.

*Control Tires:* Both treadwear and traction grades are based on comparative results using a control tire specified in the rule. The control tires are 2-ply, rayon tires of bias construction, in sizes 6.50 x 13, 7.75 x 14, and 8.55 x 15. The control tire in each specified rim diameter will be used in testing all candidate tires having that rim diameter. The precise specifications for the tires are identical to those proposed.

Control tires will be manufactured pursuant to NHTSA contract and will be used in NHTSA compliance testing. They will be made available to the industry for testing purposes, and the NHTSA will accept, for purposes of compliance tests, results based upon their performance. The agency may consider manufacturers who use different test devices to have failed to exercise the due care contemplated by the National Traffic and Motor Vehicle Safety Act should their tires fail to perform to the specified grades when subject to agency tests.

The final rule modifies certain aspects of the proposed rule apart from the grading tests. In response to several comments, labels are not required to be affixed to the tread surface of tires which are furnished as original equipment on new vehicles. These vehicles are generally driven before sale, and labels on the tire tread surface are therefore of questionable value. Information on these tires will still be required to be otherwise furnished with the vehicle, and available for retention by prospective purchasers. The NHTSA did not, however, agree with comments recommending that the affixed label requirement be deleted entirely. Tires are frequently on display in sales outlets, and the affixed label will provide consumers with the clearest understanding of the grades applicable to a particular tire.

The grades molded onto the tire sidewall are required to be placed between the shoulder and the maximum section width, rather than between the maximum section width and the bead as proposed. The NHTSA believes the grades should apply only to the original tire, and the placement of grades above the maximum section width



increases the likelihood that grades will be removed if the tire is retreaded.

Certain comments expressed the view that providing information for tires placed on new vehicles and furnishing that information to the NHTSA 30 days before the vehicles are available to the public is difficult to accomplish because of the variety of tire and vehicle combinations involved. The NHTSA does not believe sufficient justification has been shown for deleting these requirements. While some modification may be necessary to existing manufacturer practices, the NHTSA cannot agree that the regulation presents unmanageable problems for manufacturers.

*Effective date:* September 1, 1974. The NHTSA has issued this notice pursuant to an order of the United States District Court for the

District of Columbia. That order specifies that the regulation take effect on September 1, 1974.

In light of the above, sections 575.4 and 575.6 are revised, and a new section 575.104 "Uniform Tire Quality Grading", is added in Chapter V, Title 49, Code of Federal Regulations. . . .

(Secs. 103, 112, 119, 201, 203; Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407, 1421, 1423; delegation of authority at 49 CFR 1.51.)

Issued on December 28, 1973.

James B. Gregory  
Administrator

**39 F.R. 1037**  
**January 4, 1974**

## **PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION REQUIREMENTS**

**(Docket No. 25; Notice 11)**

This notice revokes the Uniform Tire Quality Grading regulation published January 4, 1974 (39 F.R. 1037), and responds to petitions for reconsideration received with respect to the regulation.

The Uniform Tire Quality Grading regulation specified the use of "control tires" in the establishment of grades for treadwear and traction. The NHTSA expected that control tires would be manufactured by an industry source pursuant to NHTSA contract, and would be available for both industry and government use. A solicitation for a proposal to manufacture control tires was advertised to the domestic tire industry. Two proposals were received. Each, however, has been determined to be nonresponsive to the solicitation, which has accordingly been cancelled.

Due to the failure of NHTSA to procure a control tire, the agency must revoke the Uniform Tire Quality Grading regulation in its present form. The revocation of the regulation renders moot the petitions for reconsideration received.

On May 2, 1974, an order was entered by the United States District Court for the District of Columbia in the case of *Nash v. Brinegar* (Civil Action No. 177-73) requiring the NHTSA to issue, by June 15, 1974, a notice of proposed rulemaking for a revised Uniform Tire Quality Grading regulation having a proposed effective date of May 1, 1975.

In light of the above, § 575.104 "Uniform Tire Quality Grading" of Chapter V, Title 49, Code of Federal Regulations, is revoked, effective

(Secs. 103, 112, 119, 201, 203; Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407, 1421, 1423; delegation of authority at 49 CFR 1.51.)

Issued on May 6, 1974.

Gene G. Mannella  
Acting Administrator

**39 F.R. 16469**  
**May 9, 1974**





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

(Docket No. 74-18; Notice 2)

This notice amends Part 575, Consumer Information, so that the requirement that manufacturers have consumer information available in showrooms does not apply to special vehicles not available to the general public.

On April 26, 1974, the National Highway Traffic Safety Administration proposed to amend Part 575 to provide consumers with information for only those vehicles which they were eligible to purchase (39 F.R. 14728). The proposal, which was in response to a petition from Ford Motor Company, stated that information concerning special vehicles would continue to be made available to eligible purchasers. Comments concerning the proposal were received from American Motors Corporation, General

Motors Corporation and Chrysler Corporation. All comments favored the proposal.

In consideration of the foregoing, 49 CFR 575.7 is amended. . . .

*Effective date:* March 13, 1975. Because the amendment relieves a restriction, it is found for good cause shown that an effective date immediately upon publication is in the public interest.

(Secs. 103, 112, 114, 203, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407, 1423; delegation of authority at 49 CFR 1.51.)

Issued on March 7, 1975.

Noel C. Bufe  
Acting Administrator

**40 F.R. 11727**

**March 13, 1975**



## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

(Docket No. 25; Notice 17)

This notice establishes Uniform Tire Quality Grading Standards. The notice is based on proposals published June 14, 1974 (39 F.R. 20808, Notice 12), August 9, 1974 (39 F.R. 28644, Notice 14), and January 7, 1975 (40 F.R. 1273, Notice 15). Comments submitted in response to these proposals have been considered in the preparation of this notice.

A rule on this subject was issued on January 4, 1974 (39 F.R. 1037). It was revoked on May 9, 1974 (39 F.R. 16469), due to the inability of the NHTSA to obtain from the tire industry "control tires" which were to have been used as the basis for determining the comparative performance grades for treadwear and traction.

The rule issued today requires manufacturers to provide grading information for new passenger car tires in each of the following performance areas: treadwear, traction, and temperature resistance. The respective grades are to be molded into or onto the tire sidewall, contained in a label affixed to each tire (except for OEM tires), and provided for examination by prospective purchasers in a form retainable by them at each location where tires are sold.

### TREADWEAR

Treadwear grades are based on a tire's projected mileage (the distance which it is expected to travel before wearing down to its treadwear indicators) as tested on a single, predetermined test run of approximately 6400 miles. A tire's treadwear grade is expressed as the percentage which its projected mileage represents of a nominal 30,000 miles, rounded off to the nearest lower 10% increment. For example, a tire with a projected mileage of 24,000 would be graded "80", while one with a projected mileage of 40,000 would be graded "130".

The test course has been established by the NHTSA in the vicinity of San Angelo, Texas, as described in Appendix A. It is the same as that discussed at the public briefings on this subject which took place July 23 and July 29, 1974, except that the direction of travel has been reversed on the northwest loop to increase safety by reducing the number left turns. The course is approximately 400 miles long, and each treadwear test will require 16 circuits. It is anticipated that both the industry, at each manufacturer's option, and the agency will perform treadwear tests on this course; the former for establishing grades, and the latter for purposes of compliance testing, i.e., testing the validity of the grades assigned. To arrange for allocations of test time at the site, industry members should contact the NHTSA facility manager, P.O. Box 6591, Goodfellow Air Force Base, San Angelo, Texas 76901; telephone (915) 655-0546. While manufacturers are not required to test on the site, it would be to their advantage to do so, since the legal standard against which compliance with the rule will be measured is a tire's performance in government tests on that course.

The method of determining projected mileages is essentially that proposed in Notice 12 as modified by Notices 14 and 15 in this docket. The treadwear performance of a candidate tire is measured along with that of course monitoring tires (CMTs) if the same general construction type (bias, bias-belted, or radial) used to monitor changes in course severity. The CMTs are tires procured by the NHTSA—one group each of the three general types—which are made available by the agency for purchase and use by regulated persons at the test site. To obtain course monitoring tires, regulated persons should contact the NHTSA facility manager at the above address.



Effective: January 1, 1976  
July 1, 1976  
January 1, 1977  
July 1, 1977

Each test convoy consists of one car equipped with four CMTs and three or fewer other cars equipped with candidate tires of the same construction type. (Candidate tires on the same axle are identical, but front tires on a test vehicle may differ from rear tires as long as all four are of the same size designation.) After a two-circuit break-in period, the initial tread depth of each tire is determined by averaging the depth measured at six equally spaced locations in each groove. At the end of every two circuits (800 miles), each tire's tread depth is measured again in the same way, the tires are rotated, vehicle positions in the convoy are rotated, and wheel alignments are readjusted if necessary. At the end of the 16-circuit test, each tire's overall wear rate is calculated from the nine measured tread depths and their corresponding mileages-after-break-in as follows: The regression line which "best fits" these data points is determined by applying the method of least squares as described in Appendix C; the wear rate is defined as the absolute value of the slope of the regression line, in mils of tread depth per 1000 miles. This wear rate is adjusted for changes in course severity by a multiplier consisting of the base wear rate for that type of course monitoring tire divided by the measured average of the wear rates for the four CMTs in that convoy. A candidate tire's tread depth after break-in (minus 62 mils to account for wearout when the treadwear indicators are reached) divided by its adjusted wear rate and multiplied by 1000, plus 800 miles, yields its projected mileage. The projected mileage is divided by 30,000 and multiplied by 100 to determine the percentage which, when rounded off, represents the candidate tire's treadwear grade.

A discussion of the NHTSA response to the comments on treadwear grading follows.

*Duration of break-in period and test.* The 400 mile break-in period originally proposed in Notice 12 was extended in Notice 15 to 800 miles, to permit the rotation of each tire between axles after 400 miles. The Rubber Manufacturers Association (RMA) suggested that a 1600-mile break-in, by permitting each tire to be rotated

once through each position on the test car, would provide more reliable results. An analysis of variance in a study conducted by the NHTSA showed no significant variations in wear from one side of a car to the other. Further, a review of data from extensive testing on the San Angelo course showed no anomalies or consistent variations in wear rate occurring after the first 800 miles. The NHTSA is convinced that the 800-mile break-in period is sufficient to allow a tire to establish its equilibrium inflated shape and stabilize its wear rate. Therefore, the RMA suggestion has not been adopted.

Many of the comments to Notice 12 suggested that testing distances greater than 6400 miles are necessary for accurate tread life projections. Testing to 40%, 50%, and even 90% of wearout was urged. Unfortunately, only the submission of North American Dunlop was accompanied by substantive data. These data, showing non-linear wear rates, were of questionable validity because the tires were not broken in prior to testing and because the data were collected by different test fleets in different parts of the country. Nonetheless, as a result of the large number of adverse comments, the NHTSA requested further information from all knowledgeable and concerned parties to document and substantiate the position that a longer treadwear test is necessary. The additional data were requested in a written inquiry to the RMA and in Notice 15. Because of the need to limit test time, test cost, and fuel consumption, the objective was to determine the minimum test distance which can reliably predict ultimate tire treadwear life.

The responses to these requests have been reviewed and analyzed. Again, the NHTSA finds the industry data and conclusions that greater testing distances are necessary lacking in rigor and completeness. In most cases, the conditions of the industry tests were not disclosed or did not coincide with the prescribed control procedures. Serious doubt is cast upon the conclusions because of inadequate information on one or more of the following test conditions: changes in weather and season, course severity, conformity with prescribed break-in period, mileage between

readings, method of projected mileage, size of convoy, number of tires tested, and uniformity and frequency of tread depth measurement.

A controlled test program recently completed by the NHTSA was designed to test the hypothesis that the rate of wear of tires is constant after an 800-mile break-in. The design and conclusions of the test are discussed in detail in a paper by Brenner, Scheiner, and Kondo ("Uniform Tire Quality Grading; Effect of Status of Wear on Tire Wear Rate," *NHTSA Technical Note T-1014*, March, 1975—General Reference entry no. 42 in this docket.) The general conclusions of the test are: (1) that the inherent rate of wear of tires, after an 800 mile break-in period, is constant and (2) that the projected tread life for a tire estimated from a 6,400-mile test after 800-mile break-in is accurate for all three tire types. Accordingly, the 6,400 mile test period has been retained.

*Grading based on minimum performance.* The RMA expressed strong disagreement with any system in which treadwear grades are based on a tire line's *minimum* projected mileage on the San Angelo test course, urging instead that the average performance of a line is a more appropriate grade. The RMA suggested further that the proposed grading system "ignores the bell-shaped distribution curve which describes any performance characteristics and would require the downgrading of an entire line of tires until no portion of the distribution curve fell below any selected treadwear grade, notwithstanding that the large bulk of a given group of tires was well above the grade."

The NHTSA rejects the arguments and the position taken by the industry on this issue. It is precisely the fact that, in industrial processes involving production of large numbers of items, the products group themselves into the so-called bell-shaped or normal distribution which allows for measurement of central tendency and variation and forms the basis of scientific quality control.

Tests performed by the NHTSA and described in the paper cited above have shown conclusively that different production tires exhibit considerable

differences in their variability about their respective average values. Thus, two different tire brands might have identical average values for treadwear, but differ markedly in their variance or standard deviation. These differences would probably be attributable to differences in process and quality control.

Recognition of differences in inherent variability among tire manufacturers and tire lines is of the utmost importance to the consumer. The average or mean measure of a group of tires does not provide sufficient information to enable the consumer to make an informed choice. If one tire on a user's car wears out in 10,000 miles, the fact that the "average" tire of that type wears to 25,000 miles in the same driving environment does not alter his need to purchase a new tire. Ideally, the consumer might be provided with more information if he were given a measure of the mean (central tendency) and standard deviation (variability) for each tire type, but the complexity and possible confusion generated by such a system would negate its advantages. In the NHTSA's judgment, the most valuable single grade for the consumer is one corresponding to a level of performance which he can be reasonably certain is exceeded by the universe population for that tire brand and line.

As with the other consumer information regulations issued by this agency, a grade represents a minimum performance figure to which every tire is expected to conform if tested by the government under the procedures set forth in the rule. Thus, any manufacturer in doubt about the performance capabilities of a line of his tires is free to assign a lower grade than what might actually be achieved, and he is expected to ensure that substantially all the tires marked with a particular grade are capable of achieving it.

*Homogeneity of course monitoring tires.* Another aspect of the Notice 12 proposal which generated much controversy is the adoption by the NHTSA of production tires for use as course monitoring tires. The commenters suggested that changes in course severity be monitored instead by tires manufactured under rigidly specified conditions to ensure homogeneity. Because varia-



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tions in the performance of course monitoring tires are reflected in treadwear projections for all candidate tires, it follows that the more homogeneous the universe of the monitoring tires, the more precisely the performance of the candidate tires can be graded. The NHTSA is in complete accord with the industry's desire to minimize the variability of tires chosen for course monitoring. The development of specifications for special "control tires", in which materials, processing, and other conditions are rigidly controlled to a degree beyond that possible for mass production, will continue. The NHTSA hopes to work with the tire industry to reduce the variability of course monitoring tires to the maximum extent possible. However, it should be noted that an earlier version of this regulation had to be revoked due to the difficulty in obtaining such "control tires." Recent tests (summarized in the paper cited above) demonstrate that implementation of a viable treadwear grading system need not be delayed further, pending development of special tires. In these tests, the current radial CMTs—Goodyear Custom Steelgards chosen from a single, short production run—show a coefficient of variation (standard deviation of wear rate divided by mean) of 4.9%. This degree of uniformity is commensurate with universally accepted criteria for test control purposes. Hence, grading of radial tires may be started immediately. The tentatively adopted bias and bias-belted CMTs showed coefficients of variation of 7.3% and 12.4%, respectively. Existing test data indicate that the NHTSA will be able to identify and procure other tires of these two construction types, exhibiting homogeneity comparable to the current radial CMTs, in time for testing in accordance with the implementation schedule set out below. In any event, the variability of course monitoring tires will be taken into account by the NHTSA in connection with its compliance testing. At worst, the degree of grading imprecision associated with CMT variability will be no greater than one-half the levels measured for the current bias and bias-belted tire lots, because the standard deviation for the average of a set of four tires is equal to one-half that of the universe

standard deviation. It is the NHTSA's judgment that treadwear grades of this level of precision will provide substantially more meaningful information to the prospective tire buyer than is currently available.

To make efficient use of the available CMTs, the NHTSA expects to conduct treadwear tests with used CMTs, as well as with new ones. This will not affect any mileage projections, because the inherent wear rate of tires is constant after break-in. Test results will be discarded if the treadwear indicators are showing on any of the CMTs at the end of a test.

*The need for three separate course monitoring tires.* Many commenters suggested that a single CMT of the bias-ply type be used, arguing that the use of a different CMT for each general construction type would create three separate treadwear rating systems. These suggestions appear to result from a misunderstanding of the role of the course monitoring tires. They are not used as yardsticks against which candidate tires are graded. Instead, they are used to monitor changes in the severity of the test course. Experiments performed by the NHTSA (Brenner, F.C. and Kondo, A., "Elements in the Road Evaluation of Tire Wear", *Tire Science and Technology*, Vol. I, No. 1, Feb. 1973, p. 17—General Reference entry no. 17 in this docket) show that changes in test course severity will affect tires of differing construction types to differing degrees. For example, the improvement in projected tread life from the severest to the mildest test courses in the experiments was 12% for bias tires, yet it was 91% for bias-belted tires and 140% for radial tires. In fact, a variety of factors influence course severity, each having different relative effects on the various tire types. Therefore, the use of a single course monitoring tire on courses of varying severity, or even on a given course whose severity is subject to variation due to weather and road wear, would not permit the correct adjustment of measured wear rates for environmental influences. Only with a CMT for each construction type can a single, uniform treadwear grading system be established.



*Expression of treadwear grades.* The system of treadwear grading proposed in Notice 12 specified six grades, as follows:

Grade X (projected mileage less than 15,000)	
Grade 15 (projected mileage at least 15,000)	
Grade 25 (       "       "       "       "       25,000)	
Grade 35 (       "       "       "       "       35,000)	
Grade 45 (       "       "       "       "       45,000)	
Grade 60 (       "       "       "       "       60,000)	

Among the objections to this proposal was that small differences in actual treadwear in the vicinity of grade boundaries would be misrepresented as large differences because of the breadth of the predetermined categories. The NHTSA was also concerned that the broad categories could in some cases reduce the desirable competitive impact of the treadwear grading system if tires of substantially differing treadwear performance were grouped in the same grade. For these reasons, a relatively continuous grading system was proposed in Notice 15, in which tires would be graded with two digit numbers representing their minimum projected mileages in thousands of miles as determined on the San Angelo test course. The major objection to both of these proposals was that grades expressing projected mileages would lead consumers to expect every tire to yield its indicated mileage. The manufacturers were especially concerned that this would subject them to implied warranty obligations, despite the disclaimer on the label. The NHTSA remains convinced that treadwear grades which are directly related to projected mileages are the most appropriate way of expressing treadwear performance. To overcome any possible misinterpretation by consumers, the grading system established today is changed from that of Notice 15 to indicate relative performance on a percentage basis, as described above. This decision is based in part upon the fact that testing performed to date on the San Angelo course has given projected mileages that are generally higher than those the average user will obtain; i.e., it appears to be a relatively mild course.

*Wheel alignment procedure.* Test vehicle wheel alignment procedures received considerable comment. Notice 12 proposed alignment to vehicle manufacturer's specifications after vehicle loading. Notice 15 proposed that this be done before loading, and that the measurements taken after loading be used as a basis for setting alignment for the duration of the test. The majority of the commenters strongly favored a return to the original procedure. The NHTSA takes particular cognizance of the fact that those commenters who have actually tried both procedures in testing at San Angelo find the procedure of Notice 12 to be satisfactory and practicable, and that of Notice 15 to be unusable. NHTSA representatives at San Angelo have reported satisfactory operation on a variety of vehicles using the originally proposed procedure, and have not observed any uneven tire wear that would indicate alignment problems. For these reasons, the final rule prescribes alignment procedures which are identical with those proposed in Notice 12.

*Tire rotation procedure.* Several commenters objected to using the proposed "X" rotation procedure for testing radial tires. The NHTSA is aware that this procedure differs from that recommended by many groups for consumers' use. While some vehicle and tire manufacturers recommend that radial tires be rotated only fore-aft, others recommend no rotation at all and yet others are silent on the subject. The primary reason for these other methods appears to be to improve passenger comfort by reducing vibration. No data have been submitted, however, to suggest that the proposed method has any adverse or uneven effect on radial tire wear. Further, this method has the advantage, for treadwear testing, of balancing out any side-to-side or axle wear differences attributable to the vehicle or to the course. Accordingly, the proposed tire rotation method has been adopted without change.

*Choice of grooves to be measured.* Some commenters suggested that treadwear projections be calculated from measurements of the most worn grooves on candidate tires, rather than from the averages of measurements made in all grooves.

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It was argued that, because many States require replacement of passenger car tires when treadwear indicators appear in any two adjacent grooves, the proposed method of calculation would yield misleadingly high projections. Analysis of projections based on both methods (Brenner, F.C. and Kondo, A., "Patterns of Tread Wear and Estimated Tread Life," *Tire Science and Technology*, Vol. 2, No. 1, 1973—General Reference entry no. 27 in this docket) shows a high correlation between the resulting tire rankings. Because the treadwear grading system established today is based on relative performance, there is no disadvantage in adopting the proposed method. On a related issue, the E.T.R.T.O. pointed out that some grooves near the tire shoulder which are designed only for esthetic reasons exhibit practically no wear, and suggested that measurements be made only in those grooves which contain treadwear indicators. This suggestion has been adopted.

*Calculation of projected mileage.* Several methods for calculating the tire wear rates to be used in determining projected mileages were considered. Notice 12 proposed calculating the geometric mean of the wear rates measured for each 800-mile increment. This approach was rejected because the geometric mean is extremely sensitive to inaccurate readings in any single measurement. Use of the arithmetic mean of the incremental wear rates appears to be the general industry practice. Unfortunately, however, the intermediate readings have no effect on such a calculation, because the result is a function only of the initial tread depth (after break-in) and that measured 6,400 miles later. Therefore, a wear rate calculated by the industry method is extremely sensitive to errors in these two measurements. In Notice 15, the NHTSA proposed that wear rate be calculated by the least-squares regression method, as described above. This approach has the advantage of weighting all measurements and minimizing the effect of inaccurate readings, so it has been adopted.

*Differing tires on a single test vehicle.* Uniroyal and the E.T.R.T.O. argued that each test convoy vehicle should be equipped with four identical tires; the reason given was that otherwise, the performance of a candidate tire would be a function of the tires chosen by the NHTSA for use on the other axle of the test vehicle during compliance testing. The NHTSA is unaware of any data that support this position. The rule adopted today requires that all vehicles in a single convoy be equipped with tires of the same general construction type, and that all tires on a single vehicle be of the same size designation. In extensive testing at San Angelo with this procedure, none of the suggested undesirable variations has been observed.

*Differing test vehicles in a single convoy.* Several commenters suggested that the rule specify that all vehicles in a given convoy be identical, to reduce variations in projected treadlife. The NHTSA is in complete agreement with the premise that those variables which can be identified and which can affect treadwear results should be controlled as closely as is feasible. Variations in vehicle type, however, do not appear to produce significant variations in treadwear projections. Nevertheless, to minimize such variations, tires will be tested for compliance only on vehicles for which they are available as original equipment or recommended replacement options. Where practical, all vehicles in a given convoy will be of the same make. However, to test tires designed for the range of wheel sizes available, the suggested method would require a proliferation of course monitoring tires, one for each combination of wheel size and construction type. Therefore, the suggestion has not been adopted.

*Accuracy of tread depth measurements.* The RMA suggested that the interval between measurements be increased to 1,600 miles to reduce the effects of measurement error. However, if this interval were used instead of 800 miles, only five readings would be obtained in the 6,400 mile treadwear test, so errors in any one reading would result in a greater overall error. A recently completed study (Kondo, A. and Brenner,



F.C., "Report on Round-Robin Groove Depth Measuring Experiment," *NHTSA Technical Note T-1012*, March 1975—General Reference entry no. 44 in this docket) shows that variations among measurements of the same tread depth by different operators do not present a serious problem. The study found that the only significant variations in measurement results occur as a result of differences in measuring techniques between different laboratories. Since these techniques are consistent within a given laboratory, the different laboratories arrive at the same results in terms of the slope of the tread depth regression line that is the basis of the treadwear grade.

### TRACTION

Traction grades are based on a tire's traction coefficient as measured on two wet skid pads, one of asphalt and one of concrete. Because a method for producing identical skid test surfaces at different sites has not yet been developed, the NHTSA has established two skid pads, described in Appendix B, near the treadwear test course in San Angelo. These pads represent typical highway surfaces. The asphalt surface has a traction coefficient, when tested wet using the American Society for Testing and Materials (ASTM) E 501 tire, of  $0.50 \pm 0.10$ . The concrete surface was described in Notice 12 as having a traction coefficient, when similarly tested, of  $0.47 \pm 0.05$ . Due to surface polishing, this coefficient has declined and stabilized at  $0.35 \pm 0.10$ . As with the treadwear course, these pads are available for use by manufacturers as well as the agency. For allocations of test time, industry members should contact the NHTSA facility manager at the above address.

Before each candidate tire test, the traction coefficient of each surface is measured with two ASTM tires to monitor variations in the surface, using a two-wheeled test trailer built in accordance with ASTM Method E-274-70. The candidate tire's traction coefficient is similarly measured on each surface, and then adjusted by adding a fixed coefficient (0.50 for asphalt, 0.35

for concrete) and subtracting the average coefficient obtained from measurements with the two ASTM tires.

The tire industry's major objection to the proposed rule was that, with four possible grades for traction, two tires might be graded differently without a meaningful difference in their performance. The RMA suggested a scheme with two grade categories above a minimum requirement. The rule issued today, by setting two threshold levels of performance, establishes three grades: "0", for performance below the first threshold; "\*\*", for performance above the first threshold; and "\*\*\*", for performance above the second threshold. The NHTSA is convinced that the grades thus defined reflect significant differences in traction performance.

Firestone suggested that further testing may demonstrate that only one pad is necessary to give the best and most consistently repeatable results. However, the ranking of a group of tires based on their performance on one surface can differ from their ranking on another surface. In fact, one tire manufacturer suggested that an additional surface of low coefficient be included in the testing scheme for this reason. The NHTSA agrees that an additional surface may increase the utility of the traction grading system, and anticipates a proposal to implement this suggestion in the future.

The suggestion of Pirelli, that measurements be made during the period between 0.5 and 1.5 seconds after wheel lockup instead of the period between 0.2 and 1.2 seconds, has been adopted. To permit more efficient use of the skid pads, the rule specifies a test sequence which differs slightly from that originally proposed: instead of being tested repeatedly on the asphalt pad and then repeatedly on the concrete pad, each tire is run alternately over the two pads. A change in paragraph (f) (2) (i) (A) permits tires to be conditioned on the test trailer as an alternative to conditioning on a passenger car. Another change facilitates the use of trailers with instrumentation on only one side, which had been inadvertently precluded by the wording of the proposed rule.



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## TEMPERATURE RESISTANCE

The major objection to the proposed high speed performance grading scheme was that it was neither necessary nor beneficial to the consumer. Several commenters pointed out that Standard No. 109 specifies testing a tire against a laboratory wheel at a speed corresponding to 85 mph, and argued that certification of a tire to this minimum requirement provides the consumer with adequate information about its performance at all expected driving speeds. They suggested that only one higher grade be established, for tires designed to be used on emergency vehicles. Some commenters indicated that, as proposed, the rule seemed to condone or even encourage the unsafe operation of motor vehicles above legal speed limits. To preclude this misinterpretation, the third tire characteristic to be graded has been renamed "temperature resistance". The grade is indicative of the running temperature of the tire. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. Therefore, the distinctions provided by three grades of temperature resistance are meaningful to the consumer. Except for the name change, this aspect of quality grading has been adopted as proposed. A grade of "C" corresponds to the minimum requirements of Standard No. 109. "B" indicates completion of the 500 rpm test stage specified in paragraph (g)(9), while "A" indicates completion of the 575 rpm test range.

## PROVISION OF GRADING INFORMATION

Several commenters objected to the proposed tread label requirement, suggesting that point-of-sale material such as posters and leaflets could provide the consumer with adequate information about tire grades. For the reasons discussed in Notice 12, the NHTSA is convinced that labels affixed to the tread of the tire are the only satisfactory method of providing complete information to replacement tire purchasers. Therefore, the scheme for transmitting quality grading information to consumers, combining sidewall mold-

ing, tread labels, and point-of-sale materials, has been adopted substantially as proposed. A change in paragraph (d)(1)(ii) clarifies the respective duties of vehicle manufacturers and tire manufacturers to provide information for prospective purchasers.

Several vehicle manufacturers requested that new vehicles not be required to be equipped with graded tires until six months after the date that tires must be graded. These commenters appear to have misunderstood the scope of the quality grading standard. The NHTSA expects that tires which comply with the standard will appear on new vehicles as inventories of ungraded tires are depleted. Part 575.6 requires of the vehicle manufacturer only that he provide the specified information to purchasers and prospective purchasers when he equips a vehicle with one or more tires manufactured after the applicable effective date of this rule.

The NHTSA has determined that an Inflationary Impact Statement is not required pursuant to Executive Order 11821. Industry cost estimates and an inflation impact review are filed in public Docket No. 25. This review includes an evaluation of the expected cost of the rule.

In consideration of the foregoing, a new § 575.104, "Uniform Tire Quality Grading Standards" is added to 49 CFR Part 575. . . .

*Effective dates.* For all requirements other than the molding requirement of paragraph (d)(1)(i)(A): January 1, 1976, for radial ply tires; July 1, 1976, for bias-belted tires; January 1, 1977, for bias ply tires. For paragraph (d)(1)(i)(A): July 1, 1976, for radial ply tires; January 1, 1977, for bias-belted tires; July 1, 1977, for bias-ply tires.

(Secs. 103, 112, 119, 201, 203; Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407, 1421, 1423); delegation of authority at 49 CFR 1.51.)

Issued on May 20, 1975.

James B. Gregory  
Administrator

40 F.R. 23073  
May 28, 1975

**PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION****(Docket No. 25; Notice 18)**

This notice republishes, with minor changes, paragraphs (e) (1) (v) and (f) (2) (i) (B), Figure 2, and the appendices of § 575.104, *Uniform Tire Quality Grading Standards*, which was published May 28, 1975 (40 F.R. 23073; Notice 17).

In describing the rims on which candidate tires are to be mounted, Notice 17 inadvertently referred to the Appendix to Standard No. 110. On February 6, 1975, the definition of "test rim" in Standard No. 109 was amended and the Appendix to Standard No. 110 was deleted (Docket No. 74-25; Notice 2; effective August 5, 1975). Under the new definition, a "test rim" may be any of several widths, only one of which is equal to that listed under the words "test rim width" in Table I of the Appendix to Standard No. 109. Paragraphs (e) (1) (v) and (f) (2) (i) (B) are corrected to specify the rim mounting scheme in terms of the new definition.

As Figure 2 was published in the Federal Register, the words "DOT Quality Grades" appeared as the Figure's title. In fact, the words are a part of the text which must appear on each tread label required by paragraph (d) (1) (B), and accordingly the figure is republished with the correct title.

The treadwear test course described in Appendix A is changed so that the loops are traveled in the following order: south, east, and north-west. This change is designed to increase safety by reducing the number of left turns. The table of key points and mileages is revised to reflect

the change. Corresponding changes are made in the numbers used to designate these points in the text and in Figure 3.

To prevent the bunching of test vehicles at STOP signs and thereby increase safety, the speed to which vehicles must decelerate when abreast of the direction sign is changed in Appendix A to read "20 mph".

The reference to Figure 2 in the second paragraph of Appendix B is corrected to indicate that the asphalt skid pad is depicted in Figure 4. The shading of the skid pads is corrected to correspond to the description in the text.

The first two paragraphs of Appendix C, *Method of Least Squares*, were omitted. Those paragraphs are now inserted and the graph is designated as Figure 5.

In consideration of the foregoing, paragraphs (e) (1) (v) and (f) (2) (i) (B), Figure 2, and the appendices to § 575.104 of Title 49, Code of Federal Regulations, are republished. . . .

(Secs. 103, 112, 119, 201, 203; Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407, 1421, 1423); delegation of authority at 49 CFR 1.51.)

Issued on June 25, 1975.

James B. Gregory  
Administrator

**40 F.R. 28071**  
**July 3, 1975**





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

(Docket No. 75-27; Notice 2)

This notice amends Standard No. 105-75, *Hydraulic Brake Systems*, 49 CFR 571.105-75, to revise the parking brake test procedure (S7.7). In addition, this notice amends Subpart B of Part 575, *Consumer Information*, 49 CFR § 575.101, by replacing the present test procedures in that section for passenger car testing with equivalent procedures from Standard No. 105-75.

The NHTSA proposed a modification of the parking brake test procedures in Standard No. 105-75 to permit a reapplication of the parking brake if the first application of the brake failed to hold the vehicle stationary on the test incline. Toyo Kogyo requested the modification as representative of normal driver action (in cases where the application appears to be insufficient to hold the vehicle), justifying the change as necessary to permit new vehicle components to stretch or "set" during the initial application as occurs in any vehicle delivered to a purchaser. The NHTSA agreed that reapplication would be a reasonable test procedure and proposed a revision of S7.7.

Comments were received from Toyo Kogyo, General Motors, American Motors Corporation, and Chrysler Corporation in support of the change. No comments were received that objected to the proposal. The standard is amended accordingly.

The NHTSA also proposed that the consumer information item requiring publication of the stopping ability of passenger cars and motorcycles (49 CFR § 575.101) be modified for passenger cars so that test data developed under Standard No. 105-75 could be the basis for the required consumer information. The existing test procedures of the consumer information item would be replaced by Standard No. 105-75 test procedures, and a transition period until Jan-

uary 1, 1977, would be provided to allow manufacturers latitude in adopting the new procedures.

The Motor Vehicle Manufacturers Association (MVMA), Chrysler Corporation, American Motors Corporation, Ford Motor Company, and General Motors Corporation supported the modifications. The MVMA and Ford pointed out an inadvertent omission in the proposal of a required change in the present loading specification (maximum loaded vehicle weight) to the Standard No. 105-75 loading specification (gross vehicle weight rating (GVWR)). No comments opposed the modification, and the consumer information item is therefore amended as proposed, with the additional modification noted by the MVMA and Ford. The transition period for use of either loading specification conforms to the transition period for use of either test procedure (until January 1, 1977). The MVMA asked for a June 1, 1977, date for transition to the new loading specification but did not explain the need for more time. The NHTSA will consider any data on this subject submitted by the MVMA.

With regard to test loading, Chrysler Corporation repeated a request for revision of the loading conditions of Standard No. 105-75. The request was earlier submitted improperly as a petition for reconsideration of an NHTSA action which did not deal with test loading (40 F.R. 24525, June 9, 1975). Section 553.35 of NHTSA regulations (49 CFR 553.35) allows petitions for reconsideration of rules issued by the NHTSA, but in this case no rule was issued on test loading that could form the basis for reconsideration. The NHTSA discussed Chrysler's request at a meeting with Chrysler officials on August 21, 1975. Based on the limited information presented by Chrysler at that meeting, the

NHTSA has concluded that a reduction in test weight would not be justified. At the meeting it was agreed that Chrysler would submit any additional data it had in support of the request. To date no data have been received, and the NHTSA cannot meaningfully reconsider Chrysler's request without further data.

The NHTSA also proposed modification of the means for establishing the skid number of the surface on which stopping distance tests are conducted in Standard No. 105-75, Standard No. 121, *Air Brake Systems*, Standard No. 122, *Motorcycle Brake Systems*, and the Consumer Information Item on brake performance. Comments received were not in agreement on how to accomplish the transition from the former ASTM method to the new one. The skid number proposal will therefore be treated separately at a later date so that its resolution will not delay this amendment of the parking brake and consumer information item test procedures.

In consideration of the foregoing, amendments are made in Chapter V of Title 49, Code of Federal Regulations. . . .

*Effective date:* January 6, 1976. Because these amendments, to the extent that they impose new substantive requirements, are made optional for an interim period, and because manufacturers must plan future testing based on the test procedures as they exist in the present standard, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119 Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51).

Issued on December 31, 1975.

James B. Gregory  
Administrator

**41 F.R. 1066**  
**January 6, 1976**

**PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION****(Docket No. 76-1; Notice 2)**

This notice amends 49 CFR 567 and 575 to allow manufacturers an alternative method of referring purchasers to appropriate consumer information tables.

On January 22, 1976, the National Highway Traffic Safety Administration issued in the Federal Register (40 FR 3315) a notice which proposed amending 49 CFR 575, Consumer Information, and 49 CFR 567, Certification, to allow the consumer information document provided to the purchaser of a vehicle to refer the reader to the vehicle's certification label to determine which information applied to that vehicle. This information, which relates to the performance characteristics of the vehicle, is required to be made available to purchasers by 49 CFR 575.6(a). Currently, if the document containing this information also contains information relating to other vehicles, the document itself must clearly indicate which information is applicable to the vehicle purchased. The NHTSA proposal was made in response to a petition from the General Motors Corporation which suggested that the proposed alternative procedure would for some companies be a more efficient and less costly method of accomplishing the purposes of the regulation.

Comments in support of the proposal were received from General Motors Corporation, Amer-

ican Motors Corporation, Chrysler Corporation and Ford Motor Company. No comments in opposition were received.

Based on the petition of General Motors and the comments concerning the notice of proposed rulemaking, the NHTSA concludes that allowing an alternative method of designating the appropriate consumer information tables would reduce the possibility of error and lessen the cost to the manufacturer.

In consideration of the foregoing, Parts 567 and 575 of Title 49, Code of Federal Regulations, are amended. . . .

*Effective date:* April 1, 1976. Because the procedures established herein are optional and impose no increased burden on any party, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 112, 114, 119, Pub. L. 80-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407); delegation of authority at 49 CFR 1.50.)

Issued on: March 26, 1976.

James B. Gregory  
Administrator

**41 F.R. 13923**  
**April 1, 1976**





## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

(Docket No. 75-27; Notice 4)

This notice amends Standard No. 105-75, *Hydraulic Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*, to modify the means for establishing the frictional resistance of the surface on which stopping distance tests are conducted. A similar amendment is made to Part 575, *Consumer Information*, of Title 49 of the Code of Federal Regulations.

The National Highway Traffic Safety Administration (NHTSA) proposed the change in Standard No. 105-75 (49 CFR 571.105-75), Standard No. 121, *Air Brake Systems* (49 CFR 571.121), Standard No. 122 (49 CFR 571.122), and the Consumer Information Regulations (49 CFR 575.101) in response to a petition from British-Leyland Motors Limited (40 FR 45200, October 1, 1975). The existing test procedure in these regulations has specified use of the American Society for Testing and Materials (ASTM) E-274-65T procedure, using an ASTM E249 tire that is no longer manufactured.

Responses were received on the proposed ASTM change from White Motor Corporation (White), Mack Trucks, Inc. (Mack), Freightliner Corporation (Freightliner), Ford Motor Company (Ford), General Motors Corporation (GM), Chrysler Corporation (Chrysler), American Motors Corporation (AMC), and International Harvester (IH). The National Motor Vehicle Safety Advisory Council made no comment on the proposal.

Most commenters supported use of the new test procedure and tire, although they differed in recommendations for correlating the reading produced under the new procedure with that produced under the old procedure. Manufacturers are presently certifying compliance to brake standards on test surfaces with a satisfactory reading under the old procedure, and they should be able to continue testing and certifying com-

pliance on the same surface without any increase in the severity of the tests. To accomplish this transition, the correlation in readings between the procedures has been determined, and the difference is reflected in a change of the dry surface value from "skid number" 75 to "skid number" 81.

Freightliner urged postponement of any action until it could be supported by "adequate and statistically reliable test data." AMC also recommended that the NHTSA do nothing "until the industry has had sufficient time to evaluate and verify the performance of the ASTM E501 test tire on all types of surfaces."

The change in procedure is prompted by the ASTM decision to utilize a new tire in ascertaining the frictional coefficient of test surfaces. As a result the old tire is no longer manufactured and only the new tire is available for skid number measurement. Manufacturers have conducted comparative tests with the new tire to determine the correlation between the readings given by the two tires. Neither Freightliner nor AMC submitted data showing that the agency's proposal to adjust the dry surface skid number upwards is unjustified. Only Mack submitted data and it supported the NHTSA and Federal Highway Administration test data that have been placed in the docket. General Motors considered the agency's proposed upward adjustment to be the maximum desirable based on its data. International Harvester, Chrysler, and Ford supported the change in dry surface skid number without qualification, and White suggested that a skid number of 85 be utilized. The agency finds that the AMC and Freightliner requests for further delay are unjustified.

Ford and Freightliner asked that the skid number for the lower coefficient (wet) surface also be adjusted. The agency's purpose in pro-

posing the adjustment is limited to changes necessary to avoid a modification of the test surfaces or an increase in the severity of performance levels specified under the safety standards. The NHTSA earlier concluded that change of the wet surface specification was unnecessary, and no evidence has been supplied that would modify the earlier determination.

General Motors noted that an editorial change to the newer ASTM procedure does not appear in early publications of that procedure. To put all interested persons on notice of the editorial change, the NHTSA has included the change in its references to the ASTM E274-70 procedure.

Freightliner asserted that the newer procedure included modification of a formula that justified a larger upwards adjustment than that proposed by the agency. Actually, the modifications only corrected an error in the earlier formula which had no effect on the determination of frictional coefficient. Manufacturers either utilized a test trailer that obviated the need for calculations using the formula, or were aware of the error and corrected for it in their calculations. Thus the adjustment requested by Freightliner is not warranted.

In accordance with recently-enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16201, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this amendment on the public and private sectors, including possible loss of safety benefit. Because the new references to procedures and a test tire are expected to accord with existing practices, the amendment is judged not to have any significant impact on costs or benefits of the standards and consumer information item that are modified by the change.

Standard No. 121, *Air Brake Systems*, is presently subject to judicial review under Section 105(a) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. Section 1394(a)). The U.S. Court of Appeals hearing the petition for review has indicated that it prefers to review the standard as it presently exists, without unnecessary amendment. To the degree possible, the agency is complying with that request and therefore, in the case of Standard No. 121, will delay the update of ASTM procedure until review is completed.

It is noted that this change in procedure for ascertaining the frictional resistance of the test surface does not invalidate data collected using the older procedure, and manufacturers can presumably certify on the basis of stopping distance tests conducted on surfaces measured by the old tire.

In consideration of the foregoing, amendments are made in Chapter V of Title 49, Code of Federal Regulations. . . .

*Effective date:* June 14, 1976. Because the older test tire is no longer manufactured, and because the amendment of procedure and test tire is intended only to duplicate the existing procedure and tire, this amendment creates no additional requirements for any person, and an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 8, 1976.

James B. Gregory  
Administrator

**41 F.R. 24592**  
**June 17, 1976**



## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION REGULATIONS

### Uniform Tire Quality Grading

(Docket No. 25; Notice 24)

*Action:* Final rule.

*Summary:* This notice announces the effective dates for implementation of a uniform tire quality grading regulation with respect to bias and bias-belted tires, as authorized by Section 203 of the National Traffic and Motor Vehicle Safety Act of 1966. This notice also responds to comments on, and makes final, proposals concerning course monitoring tires and labeling as well as to petitions for reconsideration of the rule.

*Effective date:* For all requirements, other than the molding requirement of paragraph (d)(1)(i)(A), the effective dates are: March 1, 1979 for bias ply tires, and September 1, 1979 for bias-belted tires.

For paragraph (d)(1)(i)(A), the molding requirement, the effective dates are: September 1, 1979 for bias ply tires, and March 1, 1980 for bias-belted tires. No effective date is established at this time for radial tires.

*Addresses:* Petitions for reconsideration of the tire labeling amendments should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street S.W., Washington, D.C. 20590.

*For further information contact:*

Dr. F. Cecil Brenner, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-1742.

*Supplementary information:* On May 28, 1975 (40 FR 23073), the NHTSA published as a final rule a regulation pertaining to Uniform Tire Quality Grading (UTQG) as authorized by the National Traffic and Motor Vehicle Safety Act of 1966 (the Act) (15 U.S.C. 1381 *et seq.*). The

purpose of this regulation is to alleviate confusion in the purchase of passenger car tires and to provide simple comparative data upon which an informed tire selection can be made by consumers. Under the regulation, tires will be graded in three areas of performance: treadwear, traction, and temperature resistance.

Implementation of the regulation was delayed pending litigation of the validity of its grading procedures. In *B.F. Goodrich et al v. Department of Transportation*, 541 F.2d 1178 (6th Cir., 1976), the court upheld for the most part the agency's approach to tire quality grading. The court remanded for further agency consideration, however, two aspects of the regulation. First, the court suggested that the NHTSA reexamine the labeling requirements of the regulation to ensure that sufficient warnings would be provided to consumers to avoid the misapplication of the label information. Second, the court remanded to the agency the matter of the selection of course monitoring tires, for the agency to complete its testing and selection of the three course monitoring tires or, if this had already been accomplished, for reopening of the record to permit a brief period of industry comment on the selections. The court upheld the rule in all other respects.

Pursuant to the remand in the *B. F. Goodrich* decision, the agency issued two proposals; one to modify labeling requirements and the other announcing the selection of the course monitoring tires. Comments were received from several manufacturers and manufacturer representatives. This notice responds to those comments.

In response to the publication of the UTQG regulation (May 28, 1975) (40 FR 23073), the agency received several petitions for reconsidera-

tion. The agency announced that these petitions would not be immediately answered owing to the ongoing litigation involving the regulation (40 FR 57806). Since the challenge to the regulation has now been disposed of by the court, this notice responds fully to those petitions for reconsideration.

#### *I. Labeling (Notice 21).*

On December 13, 1976, the NHTSA published a notice of proposed rulemaking to revise the traction and temperature resistance labeling requirements of UTQG (49 CFR 575.104). That notice was in response to the decision in the *B. F. Goodrich* case.

The petitioners in the *B. F. Goodrich* case argued that the then existing labeling requirements would be misleading in several respects pertaining to traction testing and temperature resistance. The court remanded those issues to the agency for further consideration, suggesting the addition to the labels of clarifying warnings. The agency's December 13, 1976 notice proposed warnings in accordance with the court's decision that would ensure that UTQG label information would not be misconstrued.

The NHTSA received seven comments in response to the notice of proposed rulemaking. Most of these comments favored the warnings proposed by the agency with several comments proposing minor editorial changes for clarity. The agency has altered somewhat the final version of these warnings in consideration of the comments. The Vehicle Equipment Safety Commission did not submit comments.

#### Treadwear Labeling

The Rubber Manufacturers Association (RMA) recommended in its comments that the agency modify the treadwear example in Figure 2 which explains that tires rated at 200 will achieve twice the mileage as tires rated at 100. RMA indicated that few if any commercially available tires could achieve such a rating. Accordingly, they suggested that the example show that a tire rated 150 would wear  $1\frac{1}{2}$  times as well as a tire graded 100.

The agency considers RMA's suggestion to have merit. Initially, the 200 figure was selected for the example because it facilitates understand-

ing of the treadwear grading concept since it speaks in terms of round numbers (e.g., a tire grade 200 wears twice as well as a tire grade 100). However, since few tires can achieve such a rating, the example would have little practical application. Therefore, the agency modifies the example to reflect that 150 represents a treadlife  $1\frac{1}{2}$  times as good as that represented by the grade of 100.

#### Traction Labeling

Goodyear Tire and Rubber Company, Firestone Tire and Rubber Company, and the RMA suggested in their comments that the NHTSA amend the traction information in Figure 2 of the label to indicate that the tires were tested under controlled conditions on specified government test surfaces. The agency believes that this information is useful to prevent misleading the consumer and amends Figure 2 accordingly.

General Motors Corporation (GM) recommended that the agency add further warnings to the traction information that would indicate that actual traction results would differ depending upon tread depth, road surface, and speed. GM contended that the proposed warning did not sufficiently detail the extent of the limitations upon the use of these traction data.

The NHTSA is concerned that the warnings printed in the tire information be kept to the absolute minimum in length while ensuring adequate consumer information. If warnings and tire information become so lengthy as to become burdensome upon the consumer to read, it is possible that the information would go unused. The agency has determined that the statement in the warning that a tire was "measured under controlled conditions on specified government test surfaces" indicates that the test results were achieved under highly specified conditions. Clearly, changes in any of the test conditions could affect the traction results. This meaning is obvious from the present wording of the warning and further elaboration would needlessly lengthen the tire information. Therefore, the agency declines to adopt GM's suggested modification.

The agency has reached the position that the clarity of the traction grading information might

be enhanced by the use of the letters A, B, and C in place of the symbols \*\*, \*, and O presently employed to denote traction grades. A proposal to modify the traction grading system by substitution of the letters A, B, and C for the present traction symbols is published concurrently with this notice in the proposed rule section of the *Federal Register*.

#### Temperature Resistance Labeling

Several commenters suggested that the tire temperature warning be clarified to indicate that excessive speed, underinflation, or excessive loading, either alone or in combination, can result in temperature increases and possible tire failure. The commenters suggested this change because heat build-up can occur at normal speeds when there is tire underinflation or overloading. The current proposal, however, implies that heat build-up would only occur at excessive speeds. The NHTSA agrees with this suggestion and modifies the temperature warning accordingly.

The RMA suggested that the label elaborate on the meaning of the temperature grades C, B, and A. The grades C, B, and A represent comparative differences in a tire's ability to withstand the generation of heat without suffering structural degeneration and potential tire failure. Although the grades C, B, and A in themselves do not inform a consumer of the specific amount of difference between tires in the three grades, the grades do convey to the consumer the fact that one tire performs better than the other in this specific test. To specify more exactly the amount of difference in heat dissipation represented by each grade or the technical nature of the test involved would merely confuse many people not versed in the technical nature of the test. Therefore, the agency has determined that the temperature grading method should be retained as it is. The NHTSA notes further that the court in the *B. F. Goodrich* case examined this aspect of temperature grading and found it to be adequate.

#### Miscellaneous Labeling

Several commenters requested that the agency implement a labeling system similar to that employed by the Federal Trade Commission (FTC) under the Magnuson-Moss Warranty Act (Pub.

L. 93-637). The FTC in its regulations (16 CFR Part 702) permits the display of warranty information in any of four locations. The commenters to Notice 21 suggested that the agency should adopt the FTC's approach since Congress could not have intended that our regulations be more burdensome than those imposed under the Magnuson-Moss Warranty Act (Warranty Act).

The purpose of the Warranty Act is to ensure the open display of warranty data in order to provide consumers an opportunity to make buying choices based upon available warranties. The purpose of UTQG is similar but not identical to the Warranty Act. UTQG, like the Warranty Act, is intended to provide information to the consumer permitting him or her to make a rational choice in the selection of a product—specifically tires. Beyond the warranty data, however, the UTQG will dispel some of the inaccuracies and otherwise misleading information currently extant in the tire marketing business.

Congress considered tire retailing procedures to be a substantial problem. Accordingly, the Congress enacted a special provision in the National Traffic and Motor Vehicle Safety Act of 1966 to provide information to consumers on these products. The agency considers this specific mandate to justify the requirement that grading information be provided in several locations. At present, grading information must be contained on the tire sidewall (49 CFR 575.104(d)(1)(i)(A)), on a label affixed to the tread surface (49 CFR 575.104(d)(1)(i)(B)), and in the information furnished under CFR 575.6(a) and (c) to motor vehicle purchasers and to prospective purchasers of vehicles or tires (49 CFR 575.104(d)(1)(ii) and (iii)). The provision of UTQG information in several locations will ensure the broadest possible dissemination of this information to consumers.

Further, unlike many other consumer goods that can be adequately handled by the Warranty Act, tires deserve additional consumer safeguards owing to their varied methods of marketing and their importance to traffic safety. Many consumer goods are purchased only as a single final unit from a retail outlet (e.g., small appliances). Tires, on the other hand, can be purchased individually or can come, as in the case of original equipment, as a component of another retail



product (a motor vehicle). Accordingly, the need for maximum dissemination of information through several labeling locations is increased by the varied methods of tire retailing. The crucial role of tires in motor vehicle safety makes it imperative that information on tire quality be brought to the attention of consumers regardless of the marketing method employed.

The agency has previously carefully assessed its requirements for labeling in compliance with UTQG. In that assessment the agency determined that the Congressional mandate coupled with the unique nature of tire marketing warranted the labeling requirements established by the NHTSA. Further, the court in the *B. F. Goodrich* case upheld this labeling approach. Therefore, the agency declines to adopt the modification suggested by the commenters concerning the establishment of alternative labeling rather than mandatory labeling in several locations.

With regard to the wisdom of the UTQG labeling system in comparison with Warranty Act provisions, it is instructive that the FTC Chairman concluded in a September 16, 1977 letter to Goodyear that "it is apparent that the Uniform Tire Quality Grading System will produce useful, reliable information for the buying public." The letter contained no suggestions for improvement of the UTQG regulation, or that the UTQG regulation is in conflict with the Warranty Act.

On a matter of general application to the information label issue, Goodyear recommended that the agency ensure that the tire grading information will be presented to the tire purchaser. To achieve this goal, Goodyear suggested that the tire retailer be required to display the information. Without such a requirement they argued, tire grading information would not be useful.

The agency agrees that the provision of information in an easily identifiable and readily accessible location is necessary to the success of the tire grading concept. This is one of the reasons that the agency has been insistent about requiring the display of this information in a uniform fashion. The NHTSA encourages the open display of this information but remains convinced that the requirement that tires contain a label on the tire tread explaining the grading system is

necessary for purposes of informing the public of tire grading. This label cannot be removed from the tire prior to sale. It is noted that a proposal to modify the requirements for this label is published concurrently with this notice in the proposed rule section of the *Federal Register*.

## *II. Course Monitoring Tires*

On February 14, 1977, the agency issued a notice of proposed rulemaking that tentatively selected the course monitoring tires (CMT's) to be used for treadwear testing (42 FR 10320; February 22, 1977). The CMT's are run on the treadwear test course simultaneously with candidate tires in order to provide an index of course variability that allows the adjustment of treadwear results for such variability. The agency had previously selected the CMT's for radial tires. The court in *B. F. Goodrich* suggested that the NHTSA select all three of the CMT's concurrently including bias ply and bias-belted CMT's which the agency had previously not selected. The court further suggested that the agency permit a short comment period to receive responses on the agency CMT selections.

Most of the comments to this proposal did not question the selection of tires chosen by the NHTSA. Rather, the comments focused upon alleged inadequacies in the NHTSA rulemaking procedures and the statistical analysis employed by the agency to determine the coefficients of variation (COV) for the tires selected. Several commenters criticized aspects of the UTQG procedures previously determined to be valid by the court in the *B. F. Goodrich* case.

### *Adequacy of NHTSA Data*

*B. F. Goodrich* and several other commenters argued that the agency did not provide ample time for meaningful comment to the notice announcing the selection of CMT's. These commenters alleged that the agency did not submit data to the docket in a timely fashion nor in complete form. For example, they argued that over 2,000 pages of data were docketed on February 14, 1977, which could have been placed in the docket as it was generated through the months of testing.

The agency placed in the public docket on February 14, 1977, more than 2000 pages of data

accumulated through tests of the course monitoring tires. The notice announcing the CMT selections was issued simultaneously, and both the data and the notice were promptly brought to the industry's attention, even though the notice was not published by the *Federal Register* until February 22. Thus, the industry was given somewhat more than the 30-day comment period to analyze and evaluate the data. Commenters should note that the court in the *B. F. Goodrich* case considered that a 30-day comment period would be sufficient to permit adequate comment on the agency announcement of the CMT selections.

The agency did not submit the data pertaining to the CMT selections to the docket in a piecemeal fashion as the commenters suggested should be done for several reasons. First, until all the data were generated and reviewed by the agency no decision could be made concerning the adequacy, in light of the court's mandate, of the CMT's initially selected by the agency. Only after accumulating a mass of data from many tests could the agency be sure of its selections and accordingly go forward with a notice making public its selections. To have released this information prior to the actual determination of the adequacy of the chosen tires would have been premature.

A second reason for waiting to release the information was the ongoing litigation on the subject of UTQG. The court's remand did not formally reach the agency until the mandate issued on December 3, 1976. Since further agency rulemaking action depended upon the outcome of the *B. F. Goodrich* case, the NHTSA considered it necessary to receive the final mandate of the court prior to continuing with its rulemaking effort with respect to UTQG. Upon receipt of the mandate of the court, the agency began rulemaking in compliance with the remand. Rulemaking proceeded expeditiously even though petitioners in the *B. F. Goodrich* case had filed a petition for certiorari.

A further criticism by the commenters concerned an alleged continued withholding by the agency of data necessary for informed comments on the CMT selections. Several commenters stated that the data in the docket contain omis-

sions. For example, the numbered data do not progress in a serial manner.

The agency has not withheld relevant information from the docket as the commenters suggest. The extent that the numbered data (test numbers) do not proceed in a serial manner results from the inclusion of the docket only of those tests involved with the computation of the coefficients of variation (COV). The COV's were computed from the first 6,400-mile cycle (after an 800-mile break-in) of the CMT, as prescribed in the UTQG regulation. Subsequent cycles run on the same CMT were not run for purposes of computing the COV. Therefore, subsequent test cycles of the same tires were deleted from the docketed data so as not to be confused with the computation of the COV's. All of the data upon which the agency based its determinations pertaining to the COV's were placed in the docket.

A further argument of the commenters was that the agency failed to include an analysis of the data indicating how our conclusions concerning COV's were achieved. The agency has used an established method for the determination of the coefficients of variation. The method chosen is an accepted statistical technique. The NHTSA does not consider it necessary to reproduce underlying, routine computations when each set of data is put into the docket.

In connection with the alleged lack of information in the docket, several commenters suggested that the NHTSA make further submissions to the docket concerning the test procedures used by the agency in testing the CMT's. The existing rule on UTQG contains the test procedures for conducting treadwear tests, and the *B. F. Goodrich* case upheld these test procedures. When the agency tests CMT's, the procedures outlined in the rule are, of course, rigidly followed. No other information relevant to the conduct of these tests exists to be placed in the docket.

Some commenters argued that the NHTSA should make public some of the test variables in existence on the days tests were conducted. For example, they suggested that weather could have an impact upon test results and, therefore, records of such weather conditions should be made available to them. The agency did not maintain such records, for the simple reason that the CMT procedure is specifically intended to account for



all such variables. Of course, data such as weather conditions, can be determined from the information contained in the docket. The test data list the date each test was run. If parties care to gather extraneous data for their own purposes, weather information for the days in question can be obtained by contacting a weather service. It should be noted that many major tire manufacturers test in Southwest Texas. Indeed, Goodyear has stated in a brochure which describes its San Angelo proving ground, that "the San Angelo area presents the most ideal conditions for tire testing in the United States." (Docket 25, GR 86.)

The RMA requested as part of their comments that, since further information should in their opinion be placed in the docket, the agency extend the comment period. The agency, as stated above, placed all pertinent information in the docket, obviating the need for an extended comment period. Further, NHTSA procedures for requesting extensions, 49 CFR 553.19, require that such a request be submitted not less than 10 days before expiration of the comment period in accordance with those procedures. Instead, the RMA included a request for extension in the body of their docket comment. It should be noted that, while the procedurally defective request was not granted, the agency has continued to accept and consider the comments of the RMA and others that have been received well after the comment closing date.

Several commenters suggested that the NHTSA publish the base course wear rates for the CMT's chosen by the agency. Publication of these wear rates, the commenters argued, was necessary for their testing of the CMT's and thus for meaningful comments on Notice 22. The agency disagrees that it is necessary to have the base course wear rates for purposes of commenting upon the tires selected by the agency as CMT's. It is the coefficient of variation experienced in the testing that is relevant to their selection as monitors of the course, and the base course wear rate is irrelevant to this consideration.

Since the commenters desired the publication of these figures, albeit irrelevant to the selection of the CMT's, the agency hereby makes them public. The wear rates for the bias ply tire

(Armstrong Surveyor 78) and for the bias-belted tire (General Jumbo 780) are 9.00 mils and 6.00 mils per 1,000 miles, respectively. Since these figures have no impact upon the selection of CMTs announced in Notice 22, no comment period is required as a result of the publication of the base course wear rates.

Firestone submitted two NHTSA technical papers for inclusion in the Docket. These papers have been modified by Firestone's underlining without other comment. These papers are included in the docket even though they are not relevant to the present UTQG regulation.

#### Possible Radial Wear Rate Problem

In Notice 22, the agency stated that the data appeared to indicate that the wear rate for some radial tires may not be constant. The NHTSA concluded, therefore, that radials would not be included for the time being under the UTQG rule, since computations made under that rule contemplate a constant adjusted wear rate for projection purposes. Industry commenters objected to this treatment of radials and argued that the agency should not proceed with any of the grading requirements unless it proceeds with them all simultaneously.

These commenters cited the *B. F. Goodrich* case which remanded the course monitoring tire issue to the agency, because a selection of all of the CMT's had not been made prior to the establishment of an effective date for the implementation of the rule to all tire types. The commenters interpreted this court mandate to mean that the agency was required to proceed with the promulgation of grading requirements for all three tire types concurrently. The agency does not interpret the court decision in that manner.

The 6th Circuit Court remanded to the agency the issue of the selection of the CMT's. It should be noted that at the time of the court decision the agency had not selected the bias and bias-belted CMT's even though it had established the effective dates for all tire types. Moreover, the court noted that the selection of the radial CMT had been based upon a series of tests (reported in NHTSA Technical Note T-1014) which were flawed by a problem not clearly identified or explained. The court's conclusion, therefore, was



that it was inappropriate to schedule the effective date for compliance of tires with UTQG when the NHTSA had not given notice and invited comment on its selection of the CMT's. This mandate of the court does not prohibit the promulgation of the rule in phases, however.

The court's opinion stated that it would be inappropriate to require grading of a tire when all of the procedures (in this case the CMT selection) had not been chosen, and commented upon, for that tire. The court did not, in the opinion of the NHTSA, state that the agency could not proceed with rulemaking on some tire types pending further study of the application of the rule to another tire type. Therefore, the agency does not find merit in the position of the commenters who allege that the agency must proceed with a rule for all tire types at the same time.

The agency has responded to the remand in Notice 22 by announcing the selection of all CMT's. That notice gave the industry adequate time to comment upon the agency's selections. However, until possible problems concerning the testing of radials are resolved, the agency will not set an effective date for the application of the rule to radial tires. As long as an effective date applicable to the grading of radials is not established prior to the establishment of grading procedures for that tire, the NHTSA can implement the rule with respect to the other tire types and is not in violation of the court's remand.

Several commenters argued that regardless of the court mandate, the NHTSA should not go forward with tire grading for two tire types while excluding radials. The commenters asserted that altered test procedures for radials could result in different tests or a different test course for radial tires which would make comparisons between them and the other tire types meaningless.

By this comment, it is apparent that some people may have misunderstood the agency's earlier notice announcing the possible problem with radials. The problem that may attend the grading of radial tires is one of computing the wear rate after the 6400-mile test has been completed, since there is some evidence suggesting that these tires may not wear at a constant rate after only an 800-mile break-in. No comparable

problem has been found for bias and bias-belted tires. Ample data have been generated demonstrating that the wear rates for bias ply and bias-belted tires are constant after an 800-mile break-in. At present there are no plans to alter the test course or the actual test procedures. If changes were considered necessary in either the test course or procedures, careful attention would then be given to their impact upon the comparative nature of the grades given other tire types. The agency would not implement test procedures for radial tires that differ from the procedures used for bias and bias-belted tires without affording adequate time for comment upon such test procedures and without carefully evaluating comments received on such test procedures.

The agency would like to note that with respect to the issue of radials, it was stated in the earlier notice that an *apparent* problem had been discovered with radials. The agency is not yet convinced that this problem does exist. However, until such time as further analysis can be accomplished, the NHTSA considers it prudent to proceed cautiously with the implementation of the UTQG requirements for radial tires.

Several commenters questioned the validity of the test procedures for testing treadwear. Goodyear stated that the driving instructions are unclear and, in particular, the braking procedure is not good. They stated further that the spacing in convoys was dangerously close on corners. Cooper Tire Company stated that the tests could not be repeated within statistically acceptable margins of error and, therefore, would be unenforceable.

The NHTSA does not agree with these comments questioning the validity of the test methodology. The agency has determined that these procedures provide a viable testing technique which can be duplicated for enforcement purposes. Further, the court in *B. F. Goodrich* upheld the test methodology. Accordingly, the agency sees no need to modify the test procedures.

Goodyear also argued that the test course has been changed since the last update of the rule by the agency. For example, they argued that some stop signs are now yield signs. On a test course of this size and nature, minor modifications of road signs are to be expected with certain regu-

larity. The regulation only lists "key points" to assist regulated parties, and has updated the regulation to reflect changes in these key points and will continue to do so. The minor changes in the test track which have occurred since the last publication of the regulation are included in this notice.

The agency notes that with respect to sign changes in the treadwear course, such minor changes have no significant impact on tire grading. The use of CMT's is designed to reduce the effects, if any, of the course variables, including course markings. Therefore, the agency considers that minor changes in the road markings which will occur from time to time should have no impact upon the comparative ratings of tires. Nevertheless, the NHTSA will make every effort to update the regulation periodically to reflect changed course markings.

### *III. Effective dates*

Several commenters asserted that the agency must propose effective dates to give the industry time to comment on the appropriateness of such dates. Notice 22 did not propose effective dates for the implementation of the regulation to bias and bias-belted tires. The agency has established the effective dates for all provisions other than the molding requirement as seven months from the publication of the final rule in the case of bias ply tires and 13 months from publication in the case of bias-belted tires. An additional six months has been provided in each case for the revision of tire molds. The issue of effective dates was litigated in the *B. F. Goodrich* case. The court there held that the implementation lead time as chosen by the agency was sufficient. The determination was based upon an evaluation of the capacity of the treadwear course and traction skid pads in relation to the number of tires to be tested. Therefore, since the agency has not modified the test procedure in any manner, there is no need to raise again the issue of effective dates as long as the agency allows the same lead time as was held valid by the court. Moreover, as noted in the court's opinion, the agency will closely monitor the actual use of the treadwear course and traction skid pads and will exercise its discretion to extend the lead time periods if it should become necessary to do so in the future.

Cooper Tire Company stated that changing the order of implementation of the requirements requires a reassessment of the effective date requirements. For example, radial tires no longer will be the first tire type to be tested. According to Cooper, a manufacturer may be harmed by the change in the order of implementation and further study of the effective dates is thus warranted.

The agency does not agree that a change in the order of implementation of the grading regulation for different tire types requires total reconsideration of the effective dates. As set forth in this notice and in Notice 22, bias ply will be the first tire construction type required to be graded. A count by NHTSA staff of the number of passenger tire lines set forth in a standard reference, "1977 Tread Design Guide" (published by the Tire Information Center, Commack, New York), excluding winter treads (snow tires) and duplicates of the same tread design, indicates that of some 1139 tire lines on the market, approximately 431 are radials, 408 are bias-ply, and the remaining 300 are bias-belted. Therefore, if ample time was provided in the previous rule for the testing of radials, and the court held that the lead time was sufficient, there certainly should be sufficient lead time to test bias ply tires which are fewer in number. Although this change may create greater test burdens for individual manufacturers, it will not impair the ability of the test facilities to accommodate tire grading.

### *IV. Statistical Comments*

The RMA criticized the NHTSA's statistical analysis of the data upon which the coefficients of variation were derived. The RMA submitted a paper written by Dr. Shelemiyahu Zacks purporting to discredit the NHTSA's analysis. Through this paper the RMA suggested that the coefficients of variation (COV) were larger than the agency had indicated.

The analysis done by the NHTSA was conducted according to statistically acceptable procedures, but the NHTSA concluded that it would be prudent to obtain an impartial review of both the Zacks' and the NHTSA's analyses of the COV's. The agency contracted with a noted statistician, Dr. Herbert Solomon, who reviewed the agency's procedures in view of Dr. Zacks' criticisms of those procedures and concluded that



the agency was correct in its method of computation of the COV's. The full text of both the Zacks and Solomon papers as well as the agency's analyses of the former are in the public docket.

Subsequent to the Solomon report, the RMA submitted several comments intended to refute the accuracy of the report. In particular, the RMA contended that the use by NHTSA of "n" ("n"=sample size), rather than "n-1", as the divisor in computing the sample standard deviation was incorrect and produced an inaccurately low COV. After careful review of this question, the agency has concluded that the use of "n" in the formula for the sample standard deviation is a proper statistical approach as a step in the process of determining the sample COV. Moreover even if the alternative "n-1" formula were adopted, the resulting COV's of 4.74, 3.08, and 2.70 for bias, belted bias, and radial tires respectively would still fall within the 5% coefficient of variation which was approved by the court in the *B. F. Goodrich* case. The RMA's other contentions were also carefully reviewed and were found to be invalid and to reiterate much of the information contained in earlier RMA comments. Therefore, the agency declines to adopt the statistical approach proffered by the RMA as well as the other recommendations of the RMA that attend their method of statistical analysis.

B. F. Goodrich submitted a statistical study by its engineering staff of models of the wear behavior of tires. (C. Thomas Wright, "The Adequacy of Linear Models in Tread Life Testing"). The agency's analysis of the study revealed that significant errors in the study accounted for Wright's differences with the linear model employed in the regulation. The agency analysis was placed in the docket, and B. F. Goodrich subsequently filed a rebuttal to the analysis. Review by the agency of that rebuttal confirms that Wright's differences with the regulation's linear model involve his failure to observe conventional statistical precepts.

Uniroyal submitted comments suggesting that the NHTSA testing procedure did not adequately consider the effects of actual driving conditions upon tire grades. Uniroyal conducted a random sampling of tires on automobiles in parking lots. The conclusion of that study was that tires wear

at varied rates depending upon the type of car, size of tire, load on the tire, and many other variables. Uniroyal suggested that its results indicated that it would have to test unlimited combinations of its tires to ensure correct grading.

The NHTSA has always stated that UTQG does not give an exact measurement of a tire's life under all conditions. The agency realizes that tire life will vary depending upon a number of conditions. The court in *B. F. Goodrich* also recognized this fact when it stated that no test designed to grade millions of tires will be perfect. Few measuring techniques are. However, for this reason the agency cautions individuals concerning misapplication of the grading information.

The Uniroyal survey yields results that are to be expected but that have no impact upon the validity of the UTQG test procedures. The test procedures for UTQG control most of the variables. The course, speed, drivers, stopping conditions, and many other variables are controlled for tire testing purposes. For those environmental variables beyond the control of the agency, the NHTSA uses the CMT to measure their effect. The Uniroyal study did not control these variables. Accordingly, it does not present an accurate picture of comparative data between tire lines. The agency has determined that comparing different tires under similar conditions on the treadwear course and traction skid pads does yield excellent comparative data. Therefore, the agency discounts the value of the Uniroyal study for purposes of questioning the validity of UTQG testing. The Uniroyal study merely indicates that the public must be cautioned against the misuse of grades provided on the tires. The NHTSA concludes that the warnings provided on the grading label information provide sufficient cautionary advice to the consumer.

Cooper Tire Company ran computer tests intended to show that the same tire might receive different grades with any two tire treadwear tests. According to Cooper this indicated that the UTQG requirements are unenforceable.

It has been argued in the past that enforcement testing for many of the agency's regulations and standards depends upon a test of a single piece of equipment or motor vehicle and accordingly



the results cannot be projected to all vehicles or equipment. In other words, the commenters suggest that a noncompliance in one vehicle or item of motor vehicle equipment does not mean that all vehicles are defective.

The agency's enforcement actions pertaining to all standards have been conducted, in the past, using a variety of data. A failure of equipment or a vehicle to reach a performance standard during an agency enforcement test indicates a potential noncompliance. The agency then goes to the manufacturer of the affected vehicle or equipment and requests the results of the manufacturer's tests or other data upon which he based his certification of compliance with the standard. A similar method of enforcement is contemplated for UTQG.

#### *V. Petitions for Reconsideration.*

On May 28, 1975, the NHTSA published the final UTQG rule. In response to that rule, several petitions for reconsideration were received by the agency. A response to these petitions for reconsideration was delayed pending the outcome of the litigation in the *B. F. Goodrich* case. Several of the issues raised in the petitions have been answered by that litigation or in subsequent notices issued by the agency. The NHTSA will now respond to those issues raised in the petitions and not previously addressed.

Several tire manufacturers commented that the lead time allowed prior to the effective date of the regulation was not adequate. The Japan Automobile Tire Manufacturers' Association, Inc. argued that there were significant time problems in the shipment of tires to the United States for treadwear testing on our test course and transmission of the resultant data back to Japan.

The issue of lead time was litigated in the *B. F. Goodrich* case. The court upheld the agency's proposed lead time. Since the agency does not propose to reduce the amount of lead time from that proposed in 1975, there should be no problem with meeting the effective date of the regulation.

Automobile manufacturers argued that they need more lead time than tire manufacturers since the specificity of the data required in the owner's manual forces them to wait until they

receive the newly graded tires before printing the manuals. On a related point, many of the manufacturers suggested that the agency require in the owner's manual only general tire grading information. They argued that this is necessary because frequently manufacturers are unable to obtain the tire with which they normally equip their cars. In such an event, they would have to print a new owner's manual containing the new tire information and would be required by Part 575 of our regulations to submit a copy of this new information to the NHTSA 30 days prior to its issuance.

The agency has determined that the automobile manufacturers should operate under the same lead time constrictions as the tire manufacturers. Therefore, the effective date of the requirements applicable to the tire manufacturers shall also be applicable to the automobile manufacturers. This will ensure complete dissemination of grading information at the earliest possible time.

The agency has concluded that the manufacturer's suggestion to provide only general tire information in the owner's manual has merit. It would be cumbersome for a manufacturer to submit to the agency for 30-day review its owner's manual information every time a change in tires was contemplated or required. The agency considers it sufficient for purposes of informing consumers, for manufacturers to provide general grading information in the owner's manual. This information would explain the grading system, giving the cautionary warnings to the consumer concerning the possible misuse of the UTQG information. The consumer could then be directed to look at the tire sidewall for the particular grading of the tire. The rule has been amended to reflect this modification.

The Motor Vehicle Manufacturers Association (MVMA) and GM argued that the temperature resistance grading system would be misleading to consumers. Both suggested a two grade approach to temperature testing using the "high speed" designation for tires designed to operate under those conditions. The agency does not agree that the temperature information will be misleading. The implementation of the proposed warnings on the misuse of the temperature information should prevent any potential for consumer misunder-

standing. The agency notes further that the court upheld the existing temperature resistance test.

Several manufacturers suggested that the NHTSA exempt the space saver tire from the UTQG requirements. They argued that this tire is designed for a limited life and for a special use only and, therefore, should not be required to comply with the regulation.

The NHTSA agrees that the space saver tire and other temporary use spare tires should be exempt from the requirements of the regulation. These tires are of reduced size or are inflatable. They are designed so that as installed in the vehicle, they reduce vehicle weight and create more vehicle interior space. Since the useful life of these tires is frequently limited to 2,000 miles, it would be inappropriate to require them to comply with the treadwear requirements. The agency amends the regulation to indicate that the space saver and temporary use spare tires are exempted from the regulation's requirements.

Volkswagen and the European Tyre and Rim Technical Organisation (ETRTO) argued that the treadwear information would confuse the public and be misused. ETRTO argued further that treadwear grading has nothing to do with safety and should be deleted from the requirements.

The treadwear labeling requirements are proper and were upheld by the court. Accordingly, the agency declines to change or delete those requirements as suggested by the manufacturers. Further, the agency notes that the UTQG regulation is promulgated under a special authorization of the Act (15 U.S.C. 1423). It is a consumer information regulation issued at the behest of the Congress.

On a related matter of labeling, ETRTO also requested that the words "treadwear", "temperature", and "traction" not be required to be molded into the sidewall owing to the expense of that operation. Once again, the 6th Circuit upheld the agency on its proposed labeling requirements while suggesting additional warnings to prevent the misuse of that information. The NHTSA requires the use of the words "traction", "treadwear", and "temperature", because these words

will help avoid confusion as to the meaning of the symbols molded onto the tire sidewall.

ETRTO also suggested that NHTSA extend the effective dates for the traction requirements since the standard test trailer can not accommodate small tires. The agency declines to extend the effective date for the implementation of the requirements. However, small tires are being excluded from the requirements until such time as a test trailer is equipped to test them.

Dunlop recommended that the lowest of the three possible tire traction grades be eliminated, on grounds that an open-ended grade would allow production of tires with extremely poor traction in order to obtain higher treadwear or temperature resistance grades. In effect, Dunlop was requesting a minimum traction standard. The agency has an outstanding proposal that would establish such a minimum standard (38 FR 31841); November 19, 1973) and will respond to Dunlop's request by means of the separate rulemaking.

Dunlop suggested that the agency permit the tire information to be molded onto the tire in two tiers using smaller size lettering. Currently the regulation requires that the information be molded into the sidewall in either one or three tiers using  $\frac{1}{4}$  inch lettering. Dunlop argued that some of their tires are too small to permit the display of information printed in one tier without conflicting with other information molded on the sidewall. Further, they stated that the depth of their tires was such that three tiers of information would not easily fit on them.

The exclusion of the smallest tires from the UTQG requirements for the time being may alleviate this problem since these are the tires that present the greatest problems concerning available space for sidewall molding. Nonetheless the agency amends the regulation to reduce the print size of the required molding from  $\frac{1}{4}$  inch to  $\frac{5}{32}$  inch. Finally, the NHTSA can see no reason not to permit the molding of information into the sidewall in two tiers. Accordingly, the agency amends the regulation establishing a format for two tier information.

In a comment by ETRTO, it was suggested that the agency clarify its position with respect to the use of front wheel drive and rear wheel

drive vehicles in a convoy for treadwear testing. The regulation states that the vehicles used will be rear wheel drive vehicles, but the preamble (Notice 17) stated that testing would be accomplished by the use of vehicles for which the tires were designed, which might include front wheel drive vehicles. In accordance with the regulation which was issued in 1975 and upheld by the court, the agency has determined that only rear wheel drive vehicles will be used for treadwear testing. This removes the possibility that any vehicle variations between front and rear wheel drive vehicles will affect the tire test results.

In accordance with Department policy encouraging adequate analysis of the consequences of regulatory action, the agency has evaluated the anticipated economic and other consequences of this amendment on the public and private sectors. The agency has determined that the regulation will benefit tire consumers by affording them more detailed information upon which to make informed tire purchases. The regulation will thus reduce some of the existing confusing claims associated with tire marketing.

As the purpose of UTQGs is to help the consumer make an informed choice in the purchase of passenger car tires, the agency will soon initiate action to evaluate whether the rule is meeting this goal. It is planned that surveys will be undertaken to determine how easily understandable and meaningful the grades are to purchasers, how the grades are utilized in purchase decisions and any measurable economic effect that may occur both within the passenger tire industry and to consumers as a result of the rule. The emphasis will be on the utility of the grading system to consumers. Major points of interest of the con-

sumer survey will be the extent to which consumers use the grading system in their purchase decisions, the extent to which it has increased their knowledge and awareness of the characteristic of various tire constructions and tire lines and whether they feel the grading system is valid and worthwhile.

*Effective date finding:* Under section 203 of the Act, the Congress stated that the regulation should become effective not sooner than 180 days nor later than one year from the date that the rule is issued. Based upon this direction and other agency findings concerning required lead time for grading tires, the agency has determined, and the Court has upheld, that phased implementation of the rule in essentially 6-month intervals is appropriate.

The program official and lawyer principally responsible for the development of this rulemaking document are Dr. F. Cecil Brenner and Richard Hipolit, respectively.

In consideration of the foregoing Part 575.104 of Title 49 of the Code of Federal Regulations, is amended. . . .

(Secs. 103, 112, 119, 201, 203; Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407, 1421, 1423); delegation of authority at 49 CFR 1.50.)

Issued on July 12, 1978.

Joan Claybrook  
Administrator

**43 F.R. 30542**  
**July 17, 1978**



## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION REGULATIONS

### Temperature for Tire Testing

(Docket No. 25; Notice 25)

*Action:* Final rule.

*Summary:* This notice establishes a uniform tire testing temperature for the test requirements of the Uniform Tire Quality Grading regulation and the Federal motor vehicle safety standard for non-passenger-car tires. This amendment simplifies existing requirements by permitting various tire tests to be conducted at the same temperature.

*Effective date:* July 17, 1978.

*For further information contact:*

Arturo Casanova III, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-1715.

*Supplementary information:* The National Highway Traffic Safety Administration (NHTSA) proposed on March 3, 1977 (42 FR 12207), to amend the ambient temperature conditions for tire testing contained in Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (49 CFR 571.119), and in Part 575, *Uniform Tire Quality Grading* (49 CFR 575.104) (UTQG). The purpose of this proposed amendment was to harmonize existing tire testing temperatures as requested by the Goodyear Tire and Rubber Company. The ambient temperatures were previously specified as follows:

Standard No. 109: " $100 \pm 5^\circ$  F."

Standard No. 119: "any temperature . . . up to  $100^\circ$  F."

UTQG: "at  $105^\circ$  F."

In the notice of proposed rulemaking, the agency proposed to amend Standard No. 119 and UTQG to reflect the tire temperature utilized in

Standard No. 109 ( $100 \pm 5^\circ$  F.). As an alternative method of expressing the test temperature, the NHTSA proposed to amend the standards to specify "any temperature up to  $95^\circ$  F."

Five comments were received in response to that proposal. All comments favored the proposed amendment that would have instituted a  $100 \pm 5^\circ$  F. temperature. The Vehicle Equipment Safety Commission did not take a position on this proposal.

After consideration of the issues involved in the proposal and review of the comments, the agency has determined that the test temperature should be expressed as "any temperature up to  $95^\circ$  F." Accordingly, Standard No. 119 and UTQG are amended to specify temperature testing at "any temperature up to  $95^\circ$  F." It is the NHTSA's opinion that the  $95^\circ$  F. test temperature is in effect the same test temperature as would be achieved by using the 5-degree tolerance ( $100 \pm 5$ ).

The NHTSA has often stated in interpretations on similar issues that the use of tolerances in safety standards reflects a misunderstanding of the legal nature of the safety standards. Standards are not instructions, but performance levels that vehicles or equipment are required by law to be capable of meeting. Any tolerance in this context would be meaningless and misleading, since it would merely have the effect of stating a performance level that the equipment must meet when tested by the government, but in a confusing manner.

Recognizing that no measurement is perfectly precise, a manufacturer's tests should be designed to show, using tire testing temperature as an example, that his tires will comply with the requirements at exactly  $95^\circ$  F. This may be done in at least two ways: (1) by using a test method

that corresponds so closely to the required temperature that no significant differences could occur as a result of differences between the actual temperature and the specified one, or (2) by determining which side of the specified temperature is adverse to the product tested, and being sure that the actual temperature of the test differs from the specified one on the adverse side.

The amendment of Standard No. 119 and UTQG to reflect the 95° F. temperature creates a different temperature phraseology for those standards than exists in Standard No. 109 which still has the 100±5° F. temperature. As stated earlier, the NHTSA considers the Standard No. 109 temperature tolerance to mean in actuality "any temperature up to 95° F." However, since modification of that standard was not proposed in the earlier notice, the agency does not amend it in this final rule. However, the agency intends to issue an interpretive amendment that will amend Standard No. 109 to adopt the alternative expression for tire temperature testing (any temperature up to 95° F.) unless objections are received.

In accordance with Departmental policy encouraging analysis of the impact of regulatory actions upon the public and private sectors, the agency has determined that this modification will

result in no appreciable safety gains or losses. These amendments may result in slightly lower costs for tire temperature testing since all temperatures will be uniform.

Since these amendments relieve restrictions and impose no additional burdens, it is found for good cause shown that an immediate effective date is in the public interest.

In consideration of the foregoing, . . . amendments are made in Parts 571 and 575 of Title 49, Code of Federal Regulations.

The program official and lawyer principally responsible for the development of this rulemaking document are Arturo Casanova and Roger Tilton, respectively.

(Secs. 103, 112, 119, 201, 203, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1421, 1423); delegation of authority at 49 CFR 1.50.)

Issued on July 12, 1978.

Joan Claybrook  
Administrator

**43 F.R. 30541**  
**July 17, 1978**

## **PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION REGULATIONS**

### **Uniform Tire Quality Grading**

**(Docket No. 25; Notice 27)**

This notice amends the Uniform Tire Quality Grading (UTQG) Standards to revise the grading symbols used to indicate traction grades and responds to a petition for reconsideration of the effective dates for the information requirement regarding first purchasers of motor vehicles. The notice, further, responds to petitions for reconsideration submitted by the Rubber Manufacturers Association and The Goodyear Tire & Rubber Company, regarding an amendment of the tire testing temperature employed in the UTQG regulation and the non-passenger-car tire safety standards, which established a single test temperature for the performance requirements of the two standards. The notice also withdraws a NHTSA proposal to modify the tread label requirements of the Uniform Tire Quality Grading Standard. These actions are intended to aid consumer understanding of the UTQG grading system and facilitate industry tire testing.

*Effective date:* October 23, 1978.

*For further information contact:*

Dr. F. Cecil Brenner, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590, (202) 426-1740.

*Supplementary information:* On July 17, 1978, (43 FR 30542), NHTSA republished the UTQG Standards (49 CFR 575.104) to assist the consumer in the informed purchase of passenger car tires. (Docket No. 25, Notice 24). The standard requires that manufacturers and brand name owners provide simple comparative data on tire performance, which can be considered by purchasers in selecting between competing tire lines. Concurrently, with issuance of the final rule, the agency proposed modifications of the standard's provisions relating to traction grading symbols and tread labels (43 FR 30586; July 17, 1978).

#### **Traction Grading Symbols**

The notice of proposed rulemaking (43 FR 30586), issued concurrently with the republished final rule, proposed revision of the symbols used to denote tire traction grades. The agency invited comment on the use of an A, B, C hierarchy of traction grades in place of the \*\*, \*, 0 system now required by paragraph (d) (2) (ii).

The Automobile Club of New York commented that the proposed traction grading symbols would be "far more meaningful to consumers" than the asterisks and zeros used in the existing regulation. The National Tire Dealers & Retreaders Association viewed the letter grading proposal as an improvement, and, in response to Notice 24, the Metropolitan Dade County, Florida, Office of the Consumer Advocate approved of an A, B, C grading system as falling within the experience of all consumers.

The only negative comment came from Atlas Supply Company which expressed concern that, if consumers are warned, as the rule requires, that tires with a C traction grade may have poor traction performance, they may assume that a C temperature resistance grade likewise denotes poor temperature resistance qualities. Atlas recommended that the lowest traction grade be abolished completely and that only the symbols A and B be used to represent traction grades.

In fact, the agency is currently considering promulgation of a tire traction safety standard which would set a minimum performance level such that tires falling within the lowest UTQG traction performance grade would not comply with the safety standard (43 FR 11100; March 16, 1978, and 38 FR 31841; November 19, 1973). Pending issuance of such a standard, however, consumers should not be misled as to the nature of the C temperature grade, since the explanation of the grading system, to be furnished under the



standard, specifically states that the C grade indicates a level of performance which meets the applicable Federal safety standard.

The agency has concluded that the A, B, C grading symbols for traction performance will be an aid to consumer understanding of the UTQG system due to the general familiarity with letter grading systems and the hierarchy inherently associated with these symbols. Consumer comprehension of the grading system will also be improved by eliminating the need to use three different sets of symbols. The symbols A, B, and C are, therefore, adopted to represent traction grades under the UTQG Standard.

#### Tread Label Requirements

The existing UTQG regulation provides that each passenger car tire, other than one sold as original equipment on a new vehicle, shall have affixed to its tread surface a label indicating the specific treadwear, traction, and temperature grades for that tire, as well as a general explanation of the grading system. In its July 17, 1978 notice of proposed rulemaking (43 FR 30586), the agency proposed to amend section 575.104 (d)(1)(i)(B) of the standard, to require only general grading information on the tread label, while retaining a separate requirement that specific grades be molded on the tire sidewall. The tread label would have been modified to include a statement referring the consumer to the tire sidewall for the actual grades of the particular tire. The notice also proposed that specific tire grades be supplied, at the manufacturer's option, on either tread labels or on the sidewall during the six-month period prior to the effective dates of the molding requirement.

In commenting on the notice, Goodyear argued that provision of specific grading information on the tread label would not be feasible and would add to the cost of implementation of the standard. American Motors Corporation commented that provision of specific grades in two places would be redundant and an unnecessary expense.

However, Michael Peskoe, an individual involved in early development of the standard, argued that the tread labeling requirement is not redundant, since tire sidewall molding was intended primarily to supply a permanent record

of the tire grades, to be considered when replacing the tires, rather than to convey information to the prospective purchaser. He also stated that, with regard to cost and feasibility considerations, tire specific identification labels, bearing information such as tire line and size, are already in widespread use within the industry to aid in the distribution of tires. Therefore, the burden of adding the specific UTQG grades for the particular tire classification should be minimal.

The Automobile Club of New York and Mr. Peskoe commented that provision of specific tire grades only on the sidewall would hinder use of the information in the situation, common in tire dealerships and service stations, where tires are displayed on racks, sidewall to sidewall. Tires would have to be removed from the display rack before the grades molded on the sidewall could be observed. The problem would be compounded where the purchaser wishes to compare the grades on several tires.

While NHTSA is concerned with keeping the cost of the UTQG regulation at a minimum, existing tire labeling and marketing practices lead the agency to the conclusion that tread labels containing specific tire grading information should continue to be required for replacement tires. The agency had earlier determined that identification of specific tire grades on tread labels is feasible and involves a very limited cost to manufacturers and consumers. Tire-specific tread labels have been demonstrated to be an integral and necessary part of the regulation's plan for getting useful information to tire purchasers. The proposal to require only general grading information on tire tread labels is, therefore, withdrawn.

#### Effective Dates for Point of Sale Information

Notice 24 set March 1, 1979, in the case of bias-ply tires and September 1, 1979, in the case of bias-belted tires, as effective dates for all UTQG requirements except the molding requirements of paragraph (D)(1)(i)(A). The molding requirements applicable to bias and bias-belted tires were made effective September 1, 1979, and March 1, 1980, respectively.

The purpose of this delayed phase-in schedule for tire sidewall molding is to provide manufacturers with extra time to prepare new tire molds

containing grading information. However, the delay in effective dates for tire molding had the unintended effect of creating a six-month interval between the time vehicle manufacturers must provide point of sale information on tire quality grading to prospective purchasers, and first purchasers of motor vehicles (49 CFR 575.104(d)(1)(ii) and (iii)) and the date on which grading information actually must appear on the tires sold. In the case of information to be furnished to first purchasers under paragraph (d)(1)(iii), potential for confusion exists since consumers will be referred to the tire sidewall for specific tire grades, when in many cases, molds will not yet have been modified for the tire lines being supplied.

To correct this situation, American Motors Corporation has petitioned NHTSA to reconsider the effective dates for paragraph (d)(1)(iii). American Motors has recommended that the effective dates for paragraph (d)(1)(iii) be amended to correspond to those of paragraph (d)(1)(i)(A), the molding requirement. The agency has already recognized the difficulties involved in providing specific grades for original equipment tires through the use of tread labels (39 FR 1037; January 4, 1974) or point of sale information (43 FR 30547; July 17, 1978). To better coordinate the availability of specific tire grading information on tire molds and the provision of explanatory information through vehicle owner's manuals, American Motors' petition for reconsideration is granted. The effective dates for paragraph (d)(1)(iii) are changed to September 1, 1979, for bias-ply tires and March 1, 1980, for bias-belted tires.

Paragraph (d)(1)(ii) of the regulation requires that vehicle and tire manufacturers furnish to prospective purchasers an explanation of the UTQG grading system. Although this provision also takes effect six months prior to the tire molding requirements, the agency has concluded that no corresponding change in effective dates is necessary. Paragraph (d)(1)(ii) provides for the availability of valuable information to prospective tire purchasers, since specific grading information will be available on replacement tires sold during the six-month phase-in period. Further, the paragraph contains no potentially confusing

reference to the tire sidewall as does paragraph (d)(1)(iii). Prospective vehicle purchasers who obtain the information prior to the sidewall molding effective dates will be given the opportunity to familiarize themselves in advance with the new grading system.

#### Temperature for Tire Testing

On March 3, 1977 (42 FR 12207), NHTSA proposed to amend Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (49 CFR 571.119), and the UTQG Standards to establish the same ambient temperature for tire testing in both standards, to allow more efficient use of tire test facilities. The notice proposed "any temperature up to 95° F" and "100±5° F" as alternative means of phrasing the new, identical test temperature.

After consideration of comments, the agency determined that the ambient test temperature should be expressed as "any temperature up to 95° F" (43 FR 30541; July 17, 1978). NHTSA received petitions for reconsideration from the Rubber Manufacturers Association (RMA) and The Goodyear Tire & Rubber Company, recommending that the test temperatures for Standard No. 119 and the UTQG regulation include tolerances and be specified as "100° F±5° F." As NHTSA has frequently stated in past notices on these and other standards (e.g., 40 FR 47141; October 8, 1975), such a recommendation reflects a misunderstanding of the legal nature of motor vehicle standards, NHTSA standards are not instructions to test engineers, but performance levels that vehicles and equipment must be capable of meeting. The use of a tolerance range in this context is confusing since it creates ambiguity as to the performance level required.

Establishment of a precise performance requirement, expressed without a tolerance, still recognizes that measurement techniques cannot be controlled perfectly. Given a specified performance level, manufacturers can design their tests to assure compliance in at least two ways: (1) by using a test procedure that conforms so closely to the specified measurement that no significant variations could occur, or (2) by determining which side of the specified level is adverse



to the product being tested, and targeting test conditions so that any deviation will occur on the adverse side. In this case, a tire manufacturer may use an ambient temperature slightly above 95° F to demonstrate, through adverse conditions, that its tire would comply at the specified temperature.

In its petition for reconsideration, Goodyear commented that all test laboratories should employ the same ambient temperature conditions. However, such uniformity is not advantageous in a regulatory context, since government compliance testing and manufacturers' laboratory evaluations are undertaken for different purposes.

Goodyear also argued that a fixed 95° F test temperature and a "100±5° F" tolerance range do not establish "in effect the same test temperature", as stated in the agency's July 17, 1978 notice (43 FR 30541). A fixed 95° F requirement is, in fact, from the manufacturers' perspective identical to a "100±5° F" provision, since, given a controlled variation in test conditions of 5° F in either direction from the target temperature, manufacturers seeking to assure compliance with a 95° F requirement will set their test target temperature at 100° F. For these reasons, the petitioners' recommendation of a "100±5° F" test temperature is rejected.

The RMA and Goodyear petitions noted that the open-ended nature of the requirement "any temperature up to 95° F" appeared to require that tires be capable of attaining specified performance levels when tested at temperatures ranging from 95° F to sub-zero conditions. The RMA petition stated as its primary concern the possibility, under the UTQG system, that a tire could be conditioned at a higher temperature than that at which it is tested for temperature resistance. Such inconsistency could, the RMA suggested, result in the tire being underinflated during testing.

The agency has concluded that the ambient temperature specification "at 95° F" more accurately describes the fixed temperature which the agency intended to establish than does the open-ended provision "any temperature up to 95° F." Standard No. 119 and the UTQG

Standards are, therefore, amended by substitution of a fixed temperature requirement of 95° F in place of "any temperature up to 95° F."

To the extent that the RMA and Goodyear petitions for reconsideration are not granted by this amendment, the petitions are denied.

In accordance with Departmental policy encouraging analysis of the impact of regulatory actions upon the public and private sectors, the agency has determined that these actions will have no appreciable negative impact on safety. Since the modification of effective dates relieves a restriction, and the change in grading symbols will result in no new burdens, no additional costs will be imposed on manufacturers or the consumer. Withdrawal of the tread labeling proposal imposes no new costs not contemplated in issuance of the UTQG Standards. The new temperature phraseology has absolutely no effect on the tire performance requirements, but will eliminate any possible ambiguity in the standards' meaning. For these reasons, the agency hereby finds that this notice does not have significant impact for purposes of the internal review.

*Effective date:* In view of the need for a fixed temperature requirement to allow tire performance testing to proceed, and the ongoing preparation by the industry for implementation of the UTQG system, the agency finds that an immediate effective date for the amendments to Standard No. 119 and the UTQG regulation is in the public interest.

In consideration of the foregoing, the following amendments are made in Part 575 and 571. . . .

(Sec. 103, 112, 119, 201, 203, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1421, 1423); delegation of authority at 49 CFR 1.50.))

Issued on October 23, 1978.

Joan Claybrook  
Administrator

43 F.R. 50430-50440  
October 30, 1978



## PREAMBLE TO AMENDMENT TO PART 575—CONSUMER INFORMATION

### Uniform Tire Quality Grading

(Docket No. 25, Notice 31)

*Action:* Final rule and establishment of effective dates.

*Summary:* This notice announces the effective dates for application of the Uniform Tire Quality Grading (UTQG) regulation to radial tires and discusses comments on previously announced testing and analysis of radial tire treadwear under the road test conditions of the UTQG regulation. This notice also interprets the effect of the thirty-day stay of the UTQG effective dates, granted by the U.S. Court of Appeals for the Sixth Circuit, and corrects an inadvertent error in the text of the regulation.

*Effective date:* For all requirements other than the molding requirement of paragraph (d)(1)(i)(A) and the first purchaser requirement of paragraph (d)(1)(iii), the effective date for radial tires is April 1, 1980.

For paragraph (d)(1)(i)(A), the molding requirement, and paragraph (d)(1)(iii), the first purchaser requirement, the effective date for radial tires is October 1, 1980.

*For further information contact:*

Dr. F. Cecil Brenner, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 205 (202) 426-1740.

*Supplementary information:* Acting under the authority of the National Traffic and Motor Vehicle Safety Act of 1966 (the Act) (15 U.S.C. 1381, et seq.), the NHTSA republished as a final rule the UTQG Standards, establishing a system for grading passenger car tires in the performance areas of treadwear, traction and temperature resistance (43 FR 30542); July 17, 1978). The regulation will provide consumers with useful, comparative data upon which to base informed

decisions in the purchase of tires. Extensive rulemaking preceded the July 17th notice, and a comprehensive discussion of the regulation's purpose and technical justification may be found in a series of earlier Federal Register notices (40 FR 23073; May 28, 1975; 39 FR 20808; June 14, 1974); 39 FR 1037; January 4, 1974; 36 FR 18751; September 21, 1971).

The July 17 notice also established effective dates for application of the regulation to bias and bias-belted tires. Establishment of an effective date for radial tires was deferred pending further analysis of test results relating to the treadwear properties of radials. Questions concerning the two other performance areas of the standard, traction and temperature resistance had previously been resolved, and therefore are not discussed in this notice.

On November 2, 1978, NHTSA issued a notice (43 FR 51735; November 6, 1978) announcing the availability for inspection of the results of the agency's test program for radial tires and NHTSA's analysis of the test results (Docket 25; Notice 28). A thirty-day period, later extended to 45 days (43 FR 57308; December 7, 1978), was provided for public comment on the data and analysis. After examination of all comments received, NHTSA has concluded that an effective date for grading of radial tires under the UTQG system can and should be established at this time.

#### Need for Grading of Radial Tires

In response to Notice 28, several commenters pointed out the importance of extending the UTQG Standards to radial tires at the earliest possible date. The Federal Trade Commission (FTC), while recognizing the establishment of a credible system for grading bias and bias-belted tires as a substantial accomplishment, commented

that extension of the system to radial tires will be of special significance to the public. The FTC, the Center for Auto Safety (CFAS), and Consumer's Union noted the increasing share of the tire market represented by radial tires, which now account for approximately half of the replacement tire market and an even higher percentage of original equipment sales. CFAS noted that NHTSA's test data revealed significant differences in treadwear properties among radial tires of different manufacturers. In fact, it is likely, based on the data, that some radial tires may yield twice the mileage of those of other manufacturers.

CFAS and the City of Cleveland's Office of Consumer Affairs commented on the need, exemplified by the recent recall of 14.5 million radials by one domestic tire manufacturer, to make safety a factor in the purchase of radial tires. The City of Cleveland reported encountering consumer frustration with present tire marketing practices and expressed concern that inability on the part of consumers to ascertain the quality of tires they are buying may lead to careless and ill-advised purchasing decisions and unsafe operating practices. NHTSA agrees and has seen no new arguments that suggest Congress' directive for establishing a uniform system for grading motor vehicle tires should not be fulfilled by the contemplated method.

#### Extent of NHTSA Radial Tire Testing

General Motors Corporation and the Rubber Manufacturers Association (RMA) contended that NHTSA's tests of radial tire treadwear were inadequate as a basis for extension of the UTQG regulation to radial tires. General Motors argued that radial tire treadwear does not become constant after tires are broken in, but continues to vary upward and downward, as evidenced by comparing adjusted wear rates in the final 6,400 miles of NHTSA's 38,400-mile radial tire treadwear test with the averages of adjusted wear rates from several 6,400-mile test series. The RMA stated its position that radial tire wear rates continue to decline in the later stages of tire life, pointing to NHTSA and RMA test data on the subject. Both General Motors and the RMA contended that, given the nature of radial tire treadwear, NHTSA must test some radial

tires to actual wearout to confirm that treadwear projections based on 6,400-mile tests correlate closely with actual tire treadlife.

NHTSA has not suggested that radial tire treadwear is precisely constant after break-in. Rather the agency's position, as stated in Notice 28, is that radial tire treadwear after break-in can be adequately described by a straight line fitted to a series of data points representing tread depth against miles traveled, thereby providing an adequate basis for treadwear projections. Variations in wear rate of the type noted by General Motors and the RMA cause a sinuous fluctuation in wear pattern which can be closely approximated by a straight line projection of treadwear based on the first 6,400 miles of testing.

NHTSA chose not to run tested tires to actual wearout because such tests are expensive and time consuming, and accurate projections of treadlife are possible with tires which have substantial wear, but are not worn out. For these reasons, projecting radial tire treadlife from tests run short of wearout is common in the industry (e.g., "A Statistical Procedure for the Prediction of Tire Tread Wear Rate and Tread Wear Rate Differences" by Dudley, Bower, and Reilly of the Dunlop Research Centre) and is, the agency has concluded, a reliable means of determining tire treadwear properties of radial, bias, and bias-belted tires.

#### Accuracy of the Treadwear Grading Procedure for Radial Tires

General Motors, Michelin Tire Corporation, and the RMA commented that the existing UTQG procedures does not project the treadlife of radial tires with a sufficient degree of accuracy, based on the data submitted to the rulemaking docket in connection with Notice 28. General Motors and the RMA noted that treadwear projections calculated only from wear rates observed in the initial 6,400-mile test sequence differed in some cases by one or two UTQG grade levels from projections based on wear rates from later 6,400-mile test cycles or from averages of several test cycles. These commenters noted that the range of such differences was slightly higher when individual tires were compared rather than the averages of four-tire sets. Michelin expressed concern that the regulation would create an im-



pression of equality among tires which in reality vary in quality. General Motors suggested that projections based on later test cycles or averages established over a longer test period would provide a more accurate projection of actual treadlife.

NHTSA established the 6,400-mile test sequence, with an 800-mile break-in, after considering the adequacy of the data which could be obtained over that test distance and the expenditure of money and resources required for additional testing. The grades arrived at by projecting from later test series or combinations of series were generally consistent with the results obtained in the first 6,400 miles of testing, and those variations which did occur were relatively minor.

As noted by the U.S. Court of Appeals for the Sixth Circuit in *B. F. Goodrich Co. v. Department of Transportation*, 541 F.2d 1178 (1976), no system designed to grade millions of tires can be expected to approach perfection. Considering the present absence of tire quality information in the market place, the agency has concluded that the UTQG treadwear grading procedure provides reasonable accuracy when applied to radial tires and will be of significant value to tire consumers in making purchasing decisions.

General Motors commented that tire grades should be assigned based on the lowest mileage projected for any tire among a set of four candidate tires and not on the average projected mileage of a four tire set. The UTQG regulation states that each tire will be capable of providing at least the level of performance represented by the UTQG grades assigned to it. UTQG grades based solely on either average grade levels or on the projected mileage of a particular tested tire would not provide an adequate basis for consumer reliance on the grading information. In determining accurate treadwear grades for tire lines, manufacturers must consider the population variability evidenced in their tire testing.

#### Validity of the CMT Adjustment Procedure

The UTQG regulation accounts for environmental influences on candidate tire wear rates during testing by means of an adjustment factor derived by comparing the wear rates of concurrently run course monitoring tires (CMT's) with

an established CMT base course wear rate (BCWR) (49 CFR 575.104(d)(2)). In Notice 28, NHTSA explained how the same adjustment procedure could be used to correct for a measurement anomaly that generates the appearance of a higher wear rate for radial tires in the first 4,000 miles of testing following the 800-mile break-in. In response to Notice 28, CFAS reviewed the UTQG adjustment procedure, as it applies to radial tires, and commented that this procedure is the proper method for grading radials. However, Michelin and the RMA, in their comments on that notice, suggested that the CMT adjustment procedure may be invalid for radial tires, both in the context of wear rate changes and as a control on environmental factors.

The RMA argued that NHTSA has not provided supporting data for its theory that the shift in radial tire wear rate during the initial phases of treadlife is caused by changes in tire geometry as the tire attains its equilibrium shape. However, detailing the underlying mechanism of the apparent change in wear rate is incidental to the fact that radial tire wear rates do stabilize in a consistent fashion, permitting use of the CMT adjustment to project treadlife with reasonable accuracy.

The RMA contended that wear patterns of certain radial tires differ markedly from the apparent accelerated pattern observed by NHTSA during the first 4,000 miles of treadlife after the 800-mile break-in, and that NHTSA's test of several tire brands provided an inadequate basis to draw conclusions about radial tires in general. Michelin, although citing no data on the subject, commented that an accelerated wear pattern in the early stages of treadlife may not exist in all radial tires to the same degree.

NHTSA's test of radial tire treadwear, reported in Notice 28, included ten different tire brands, selected to include a wide range of prices and materials, as well as both domestic and foreign manufacture. This sample constitutes a reasonable and adequate basis upon which to draw conclusions concerning tires available on the American market. In spite of the wide variety of radial designs included in NHTSA's test, the agency found the wear rate patterns of the tires studied to be remarkably consistent in the initial



6,400-miles of testing, after the 800-mile break-in. This consistency is exemplified by treadwear projections in the paper "Test of Tread Wear Grading Procedure—the Course Monitoring Tire Adjustment on Radial Tire Wear Rates", by Brenner and Williams (Docket 25, General Reference No. 105), which compared estimates of tread life for nine sets of candidate tires based on data from the first 6,400 miles of testing after break-in, with estimates based on data from 6,400 to 38,400 miles of testing. The projections computed from these data sets did not differ significantly, indicating that the UTQG adjustment procedure accurately accounted for the initial wear rate characteristics of all tires tested.

Based on this test experience, the agency believes that the data from its tests and analysis of that data has demonstrated that the wear patterns exhibited by radial tires early in their treadlives are sufficiently consistent to permit accurate projection of treadwear based on the existing UTQG test procedure. NHTSA plans to closely monitor testing at the San Angelo course to insure that the UTQG test procedure accommodates future developments in tire technology and continues to provide an accurate basis for treadwear grading.

On the question of consistency beyond the initial 4,000 miles of testing, both Michelin and the RMA argued that not all tires tested by NHTSA responded to environmental factors in an identical manner, as demonstrated by comparing graphs of unadjusted candidate tire wear rates by test cycle with graphs of data from concurrently run CMT's. The RMA also noted that graphic representations of radial tire adjusted wear rates per test cycle were not always horizontal, but in some cases sloped somewhat upward or downward.

Close examination of the graphs of unadjusted candidate tire wear rates and CMT wear rates indicates that the wear rates fluctuated in a reasonably parallel fashion in all but an insignificant number of cases. NHTSA has never contended that every tire of every brand must behave in a perfectly consistent manner before a valid grading system can be established. NHTSA finds that the level of consistency exhibited by the tested tires is sufficient to confirm the validity of

the CMT approach as a reasonably fair and reasonably reliable means of radial tire grading.

With regard to the slope of the adjusted wear rate curves, NHTSA has applied a test of independence to this data to determine if the adjusted wear rates of the tested tires were dependent on the test cycle. In no case was the slope significantly different from zero at the 95 percent confidence level. In fact, of the curves which slanted to any measurable degree, sixteen had a slightly positive slope and seventeen had a slightly negative slope, as would be expected if the true slope were zero. This analysis suggests that CMT and candidate tires continue to wear in a consistent fashion beyond the initial phase of testing.

The RMA's comments suggest that some confusion may exist as to whether CMT's are to be reused for testing after an initial 6,400-mile test cycle after break-in. Since radial tires, including CMT's, exhibit an apparent change in wear pattern during this initial phase of treadlife, when measured by a tread depth gauge, the CMT adjustment procedure will be accurate only if new candidate tires are run with new CMT's so that the wear rate change occurs in all tires simultaneously.

Radial CMT's were run beyond the initial 6,400-mile cycle in NHTSA's testing announced in Notice 28, in order to provide an extended comparison of CMT's and candidate tires run concurrently. In its UTQG compliance testing, however, NHTSA will use new radial CMT's, broken-in in accordance with 49 CFR 575.104 (d) (2) (v), for each 6,400-mile test.

Also on the issue of the CMT adjustment procedure, the RMA commented that NHTSA's test data indicate a coefficient of variation (COV) for radial CMT's of over 5 percent, the standard upheld in the *B. F. Goodrich* case as the agency's target for the maximum permissible level of variability for these tires. Much of the data cited by the RMA on this point involved test cycles beyond the initial 6,400-mile cycle, after break-in. Data on the variability of CMT's at test distances beyond 6,400 miles, after break-in, are irrelevant to the UTQG system, since, as noted above, radial CMT's will not be reused after an initial 6,400-mile test cycle.

In examining data from the initial test cycle, the RMA combined wear rates from several test vehicles and then developed COV's from that data, thereby interjecting vehicle variability into the computation. Vehicle variability, while unrelated to the properties of the tire, has the effect of inflating coefficients of variation. When this extraneous factor is removed from the computation, the test data indicate a COV well within the acceptable 5 percent level.

Michelin expressed concern that running CMT's of a standard size with candidate tires of differing sizes may lead to inaccuracy in the adjustment of data. National Bureau of Standards Technical Note 486, "Some Problems in Measuring Tread Wear of Tires," by Spinner and Barton (Docket 25, General Reference No. 4), compared projected mileages for three sizes of radial and bias-ply tires of several manufacturers run under different road conditions. Data in the report suggest that tires of different sizes react similarly to differing external conditions. Therefore, the practical burden of providing a different CMT for each size of candidate tire may be avoided.

Finally, General Motors and the RMA asserted that, in order to facilitate comparisons among radial, bias, and bias-belted tires, BCWR's must be established by running the three types of CMT's concurrently to limit the influence of environmental variables on the test results. The RMA also contended that a BCWR cannot be established without running CMT's to actual wearout.

NHTSA established BCWR's through experience with tires of all three construction types in over 5 million tire miles of testing over a two year period. In the course of this extensive testing, each tire type can be expected to have encountered a random mix of environmental conditions resulting in a similar net impact on treadwear.

#### Other Comments

Michelin commented that the regulation's procedure of rotating tires among different positions on a test vehicle, but not between vehicles, precludes the detection of vehicle mechanical problems which could affect grading. Adequate preventive maintenance of test vehicles is the

primary safeguard against distortion of data by vehicle malfunctions. Additionally, an analysis of variance of the data obtained in a convoy or on a vehicle provides another effective method of detecting a malfunction. (See, "Elements in the Road Evaluation of Tire Wear", by Brenner and Kondo, Docket 25; General Reference No. 17). NHTSA does not believe that rotation of tires among vehicles would significantly improve on these existing techniques.

General Motors noted that several tires studied by NHTSA had to be removed from the test due to failure or uneven wear prior to actual wearout and suggested that the agency must account for these anomalies before proceeding with rule-making.

Early in the course of rulemaking on UTQG, NHTSA concluded that considerations of cost and consumer understanding required some limitation on the number of grading categories in which UTQG information would be presented. Based on examination of numerous comments in the rulemaking docket, the agency concluded that treadwear, traction, and temperature resistance are the tire characteristics of greatest importance to consumers. For this reason, information on subjects such as evenness of tread wear and susceptibility to road hazard damage, while of value to consumers, is not provided under the regulation. NHTSA will consider General Motors comment, however, as a suggestion for possible future rulemaking.

The RMA noted several minor computational and other errors in the previously referred to paper by Brenner and Williams (Docket 25, General Reference No. 105), submitted to the docket in connection with Notice 28. Some of these errors were corrected by a subsequent submission to the docket (Docket 25, General Reference No. 105A). In any case, the errors were of a non-substantive nature and had no impact on the agency's rulemaking process and decisions.

#### Impact of the Thirty Day Stay of Effective Dates

On January 19, 1979, the U.S. Court of Appeals for the Sixth Circuit, in the case *B. F. Goodrich Co. v. Department of Transportation* (No. 78-3392), granted a thirty-day stay of the effective dates for application of the UTQG regu-

lation to bias and bias-belted tires. The regulation was scheduled to become effective March 1, 1979 for bias-ply tires and September 1, 1979 for bias-belted tires, with the exception of the sidewall molding requirements of paragraph (d)(1)(i)(A) and the first purchaser requirements of paragraph (d)(1)(iii) which were to become effective September 1, 1979 and March 1, 1980 for bias and bias-belted tires, respectively.

NHTSA interprets the Sixth Circuit's action as postponing the effective dates of the UTQG regulation one month to April 1, 1979 for bias-ply tires and October 1, 1979 for bias-belted tires. However, the effective dates for the molding requirements of paragraph (d)(1)(i)(A) and the first purchaser requirements of paragraph (d)(1)(iii) are postponed to October 1, 1979 for bias-ply tires and April 1, 1980 for bias-belted tires to allow manufacturers time to convert tire molds. This postponement of effective dates has been taken into account in establishing effective dates for application of the regulation to radial tires, to assure adequate lead time for completion of tire testing.

In accordance with Departmental policy encouraging adequate analysis of the consequences of regulatory actions, the agency has evaluated the anticipated economic, environmental and other consequences of extending the UTQG regulation to include radial tires and has determined that the impact of this action is fully consistent with impacts evaluated in July 1978 in establishing effective dates for bias and bias-belted tires. Based on the authority of Section 203 of the Act,

previous agency findings concerning required lead time for grading tires, and the decision of the U.S. Court of Appeals for the Sixth Circuit in *B. F. Goodrich*, the NHTSA hereby establishes radial tire effective dates consistent with the basic six-month phase-in schedule announced on July 17, 1978 (43 FR 30542) for bias and bias-belted tires.

In an unrelated matter, NHTSA's FEDERAL REGISTER notice announcing effective dates for application of the UTQG Standards to bias and bias-belted tires (43 FR 30542; July 17, 1978) contained an inadvertent error in use of the word "of" rather than the intended word "are" in the first sentence of the third section of Figure 2 of the regulation. This error is corrected by substitution of the word "are" in place of "of" in Figure 2.

In consideration of the foregoing, the Uniform Tire Quality Grading Standards (49 CFR 575.104), are amended . . .

The program official and lawyer principally responsible for the development of this rulemaking document are Dr. F. Cecil Brenner and Richard J. Hipolit, respectively.

(Sec. 103, 112, 119, 201, 203; Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407, 1421, 1423); delegation of authority at 49 CFR 1.50.)

Issued on March 9, 1979.

Joan Claybrook  
Administrator

**44 F.R. 15721-15724**  
**March 15, 1979**



## **PREAMBLE TO AN AMENDMENT TO PART 575—CONSUMER INFORMATION**

### **Uniform Tire Quality Rating**

**(Docket No. 25; Notice 35)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends the Uniform Tire Quality Grading (UTQG) Standards through minor modifications in the format of tire tread labels used to convey UTQG information. The modifications are intended to assure that tires are labeled with the correct UTQG grades, to permit flexibility in the design of labels, and to facilitate consumer access to the grading information.

**EFFECTIVE DATE:** December 1, 1979.

#### **FOR FURTHER INFORMATION CONTACT:**

Dr. F. Cecil Brenner, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1740).

**SUPPLEMENTARY INFORMATION:** On January 8, 1979, NHTSA published a request for public comment (44 F.R. 1814) on a petition for rulemaking submitted by Armstrong Rubber Company asking that the UTQG regulation be amended to permit tire grading information and explanatory material concerning the UTQG system to be furnished to consumers by means of two separate tire tread labels rather than the single label called for in the regulation (49 CFR 575.104(d) (1) (i) (B)). Armstrong, joined by Atlas Supply Company, contended that the chance of mislabeling tires would be reduced, if UTQG grades could be placed on the same label with tire identification information. However, practical limitations exist on the size of tread labels which can be effectively applied and retained on the tire tread surface. Some manufacturers reportedly encountered difficulty in fitting tire identification information, UTQG grades and required UTQG explanatory information on a single label. For this reason, Armstrong and Atlas suggested that UTQG explanatory information be furnished on a

separate label adjacent to a label containing UTQG grades and tire identification information.

In view of the favorable comments received in response to NHTSA's request for comment on the Armstrong petition, the agency proposed to modify the tread label format requirements to employ a two-part label format (44 F.R. 30139; May 24, 1979). NHTSA proposed that Part I of the label contain a display of the UTQG grades applicable to the particular tire while Part II would contain the general explanation of the grading system. At the manufacturer's option Parts I and II could appear on separate labels. To assure that the labels would be legible to consumers, the notice also proposed requirements for orientation of the label text and minimum type size.

Commenters on the proposal were in general agreement that flexibility in the design of tire tread labels is a desirable goal. While some manufacturers expressed the opinion without explanation that two-part labels would be impractical for their operations, others welcomed the proposal as a means of dealing with label size limitations.

Some commenters favored retention of the original label format pointing out that the proposed label would be slightly longer than its predecessor and arguing that the proposed label would isolate the tire grades from the explanatory material. Some industry sources expressed the opinion that the proposed changes would be of no benefit to consumers.

NHTSA disagrees with these criticisms of the proposal. The new format should increase the length of the label by only a fraction of an inch, if at all, and should not pose a problem to manufacturers wishing to employ a single label. The separation of the grades from the explanatory material should not create confusion since the two

parts could be separated by no more than one inch in any case. The agency has reached the conclusion that displaying grades for all three performance categories together on Part I of the label will in fact benefit consumers by facilitating access to the information.

Maximum retainability will be assured with the new format since manufacturers may choose to employ two labels if they are unable to fit all of the necessary information on a single label of a manageable size. Similarly, the possibility of mislabeling will be reduced, because the two-part option makes it possible in all cases to include applicable UTQG grades on tire identification labels. For these reasons, NHTSA has determined to adopt the proposed two-part label format with minor modifications.

Several commenters suggested that orientation of the tread label text should not be specified in the regulation since flexibility in label design would be reduced by such a requirement. However, NHTSA has concluded that since most manufacturer's tire identification labels are arranged with lines of type running perpendicular to the tread circumference, tires are most likely to be displayed so that labels with this orientation will be easily readable by consumers. Therefore, the agency has chosen to retain the proposed requirement regarding label text orientation.

Goodyear Tire & Rubber Company suggested the possibility of printing Part I of the proposed label below Part II, when both parts are contained on a single tread label. NHTSA finds this suggestion unacceptable because the UTQG grades would be difficult to locate if preceded by a body of textual material.

Goodyear also commented on several occasions that specifying a minimum type size for the printing of labels would be of no benefit since many factors other than type size, such as letter style, spacing, and format, contribute to legibility. NHTSA agrees that a minimum type size requirement alone is insufficient to assure the readability of labels. For this reason, NHTSA has chosen to withdraw its proposed minimum type size requirement at this time. The agency will, however, continue to monitor industry compliance with the labeling requirements to ascertain whether a comprehensive set of requirements is necessary to assure that tread labels will be legible to consumers.

The agency has found considerable merit in another Goodyear suggestion, to delete the range of possible grades adjacent to the categories "TRACTION" and "TEMPERATURE" on Part II of the label. These letters were originally included on the label to provide a display on which the grade attributable to a particular tire could be marked. Since grades will now be marked on Part I of the label, the range of possible grades in Part II is superfluous and has been deleted from the required format. If, however, manufacturers wish to display the array of grades on both Part I and Part II of their labels, NHTSA has no objection to this practice.

Goodyear was joined by General Tire & Rubber Company in requesting that NHTSA clarify whether the three category headings, "TREADWEAR," "TRACTION," and "TEMPERATURE," in Part I of the proposed label must be laid out side by side, across the label, or one below the other, down the label. In the interest of flexibility, the regulation makes either of these layouts acceptable, although the relative order of the categories must be maintained to permit easy reference to the explanatory material.

Similarly, several manufacturers recommended that the regulations permit grades to be displayed either to the right of or directly below the grading category to which they apply. Again, to facilitate efficient label design, the regulation permits the use of either of these locations for the display of grades.

Industry commenters asked that NHTSA clarify whether the use of lower case letters in the label text, as set out in Figure 2 of the regulation, precludes manufacturers from printing labels using all capital letters in the label text. The regulation has been modified to permit the optional use of all capital letters in printing the text of Figure 2.

NHTSA wishes to confirm Firestone Tire & Rubber Company's understanding that the words "Part I" and "Part II" appearing in Figure 2 as proposed are for reference purposes only and need not be printed on the tread label. General and the Rubber Manufacturers Association called NHTSA's attention to certain typographical errors in the proposed Figure 2 text, which have been corrected in the amendment as adopted.

Several manufacturers suggested that the original label format be permitted as an option, or

that, as a minimum, waste be avoided by allowing labels printed with the original format to be used up regardless of the adoption of a new label format. NHTSA considers the new two-part label format to be superior to the original format in terms of clarity and readability. Therefore, the agency has concluded that universal conversion to the new format is desirable. However, since manufacturers have expended significant resources in efforts to comply with the original labeling requirement, NHTSA will permit the use of labels employing the original format, at the manufacturers option, until October 1, 1980. This period of flexibility should permit any labels already printed to be used up and allow a smooth transition to the new format.

Since this amendment will increase manufacturers' flexibility in complying with the UTQG

labeling requirements, and since the transition to the new labeling format will be phased in so as to avoid economic waste, the agency has found that this notice does not have significant impact for purposes of internal review. In view of the fact that some manufacturers may still be in the process of obtaining labels for their bias-belted tire lines, this amendment will become effective December 1, 1979.

Issued on November 20, 1979.

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Joan Claybrook,  
*Administrator*

**44 F.R. 68475**  
**November 29, 1979**





## **PREAMBLE TO PART 575—CONSUMER INFORMATION REGULATIONS UNIFORM TIRE QUALITY GRADING**

**(Docket No. 25; Notice 38)**

**ACTION:** Interpretation.

**SUMMARY:** This notice clarifies the procedure to be used under the Uniform Tire Quality Grading (UTQG) Standards in measuring tread depth of tires without circumferential grooves or with a limited number of grooves. The regulation's provision for measurement of tread depth in tire grooves has given rise to questions concerning the proper means of measurement for such tires. This notice is intended to facilitate testing of tires of this type.

**EFFECTIVE DATE:** This interpretation is effective immediately.

**FOR FURTHER INFORMATION CONTACT:**

Mr. Richard Hipolit, Office of the Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1834).

**SUPPLEMENTARY INFORMATION:**

The UTQG Standards (49 CFR 575.104) require the grading of passenger car tires on three performance characteristics: treadwear, traction and temperature resistance. In setting forth the procedure to be followed in evaluating treadwear performance, the regulation states that, after an 800-mile break-in, tires are to be run for 6,400 miles over a designated course, with tread depth measurements to be taken every 800 miles. The regulation specifies that tread depth is measured at six equally spaced points in each tire groove other than shoulder grooves, avoiding treadwear indicators. Tire grooves are typically arranged symmetrically around the center of the tread.

On May 24, 1979, the National Highway Traffic Safety Administration (NHTSA) published in the *Federal Register* (44 FR 30139) an interpretation that tires designed for year round use do not qualify as "deep tread, winter-type snow tires,"

which are excluded from the coverage of the UTQG regulation by 49 CFR 575.104(c). In response to this interpretation, the Goodyear Tire & Rubber Company commented to NHTSA (Docket 25; Notice 32-011) that a technical problem may exist in the measurement of tread depth of tires for year round use since circumferential grooves are absent in the designs of many such tires.

NHTSA is aware that certain other standard tire designs, as well as year round designs, may incorporate lugs, discontinuous projections molded in the tread rubber, separated by voids, in place of ribs defined by circumferential grooves. In other cases, the limited number of grooves on the tire could lead to inaccurate results if measurements were made in only those grooves.

To assure accurate tread depth measurements on tires lacking circumferential grooves, and tires with fewer than four grooves, measurements are to be made along a minimum of four circumferential lines equally spaced across the tire tread surface. These lines are to be symmetrically arranged around a circumferential line at the center of the tread. The outermost line on each side of the circumferential tread centerline is to be placed within one inch of the shoulder.

Measurements are to be made at six equally spaced points along each line. If the design of the tire is such that, on a particular circumferential line, six equally spaced points do not exist at which groove or void depth exceeds by  $\frac{1}{16}$ th of an inch the distance from the tread surface to the tire's treadwear indicator, measurements are not to be taken along that line. If measurements cannot be taken on four equally-spaced, symmetrically-arranged lines, the requirement for equal spacing does not apply. Measurements in that case are to be taken along a minimum of four lines, with an equal number of symmetrically arranged measured lines on either side of the tread centerline.

NHTSA recognizes that, due to the implementation schedule of the regulation, certain manufacturers may have already conducted treadwear tests on tires falling within the scope of this interpretation. The Agency does not object to the use in grading of treadwear data generated prior to the publication date of this notice, if such data was acquired using a test method varying only in minor, non-substantive respects from the method described in this interpretation.

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The principal author of this notice is Richard J. Hipolit of the Office of Chief Counsel.

Issued on March 24, 1980.

Joan Claybrook  
Administrator

**45 F.R. 23441**  
**April 7, 1980**



# **PREAMBLE TO AMENDMENTS TO PART 575—CONSUMER INFORMATION REGULATIONS; UNIFORM TIRE QUALITY GRADING**

**(Docket No. 25; Notice 39)**

**ACTION:** Final Rule.

**SUMMARY:** This notice amends the Uniform Tire Quality Grading (UTQG) Standards to exclude from the requirements of the regulation tires produced in small numbers, which are not recommended for use on recent vehicle models. The amendment is intended to reduce costs to consumers and reduce regulatory burdens on industry in an area where the purchase of tires based on comparison of performance characteristics is limited.

**EFFECTIVE DATE:** This amendment is effective immediately.

**FOR FURTHER INFORMATION CONTACT:**

Dr. F. Cecil Brenner, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1740).

**SUPPLEMENTARY INFORMATION:**

The UTQG Standards 49 CFR § 575.104 are intended to enable consumers to make an informed choice in the purchase of passenger car tires through the use of comparative performance information relating to tire treadwear, traction and temperature resistance. The standards apply to new pneumatic tires for use on passenger cars manufactured after 1948. Deep tread, winter-type snow tires, space-saver or temporary use spare tires, and tires with nominal rim diameters of 10 to 12 inches have been excluded from the application of the regulation (49 CFR § 575.104(c)).

Several tire manufacturers and dealers have informed the National Highway Traffic Safety Administration (NHTSA) that a small class of tires exists for which marketplace competition based on performance characteristics is extremely limited. These tires, which are purchased for use on vehicles manufactured after 1948 but nonetheless

considered by their owners to be classic or antique, are produced in small numbers in a wide variety of designs and sizes. Purchasers of these tires are reportedly concerned primarily with appearance, authenticity, and availability rather than tire performance.

Information supplied by Intermark Tire Company indicates that a similar limited market exists for tires used on older vehicles requiring tire sizes no longer employed as original equipment on new vehicles. Intermark petitioned NHTSA to remove these tires from the coverage of the regulation on the basis that little market competition exists in their sale and that availability is the primary factor in the purchase of this class of tire.

In order to reduce costs to consumers and eliminate the need for industry to grade the multiplicity of small lines of tires in which comparative performance information would have limited value, NHTSA published a notice proposing to remove certain limited production tires from the application of the UTQG regulation (45 FR 807; January 3, 1980). Four criteria, were specified to define limited production tires. First the annual production by the tire's manufacturer of tires of the same design and size could not exceed 15,000 tires. Second, if the tire were marketed by a brand name owner, the annual purchase by the brand name owner could not exceed 15,000 tires. Third, the tire's size could not have been listed as a manufacturer's recommended size designation for a new motor vehicle produced or imported into this country in quantities greater than 10,000 during the preceding calendar year. Fourth, the annual production by the tire's manufacturer, or the total annual-purchase by the tire's brand name owner, if applicable, of different tires otherwise meeting the criteria for limited

production tires could not exceed 35,000 tires. The proposal also clarified that differences in design would be determined on the basis of structural characteristics, materials and tread pattern, rather than cosmetic differences.

Commenters on the proposal, including the Rubber Manufacturers Association, the National Tire Dealers and Retreaders Association, Dunlop Limited, Intermark, Kelsey Tire Company and McCreary Tire and Rubber Company agreed that tire quality grading should not be required for limited production tires. Among the reasons stated for support of the proposal were expected cost savings to industry and the consumer and the special consideration affecting the purchase of these tires. After consideration of these comments, the agency has adopted the proposed amendment with minor modification.

Intermark pointed out a possible anomalous situation which could result from the wording of subparagraph (c)(2)(iv) of the proposal. That provision placed a 35,000 tire limit on a manufacturer's total annual production of tires meeting the limited production criteria, *or*, in the case of tires marketed under a brand name, on the total annual purchase of limited production tires by a brand name owner. Thus, under this commenter's reading of (c)(2)(iv), 40,000 tires meeting the criteria of subparagraphs (c)(2)(i), (ii), and (iii) could be produced by a manufacturer, sold in groups of 10,000 to four different brand name owners, and still qualify as limited production tires. At the same time, another manufacturer could produce 40,000 tires meeting the first three criteria for sale in its own company outlets and be required to grade the tires. To make it clear that the 35,000 tire limitation on manufacturer's production applies whether or not the tires are marketed by a brand name owner, subparagraph (c)(2)(iv) has been modified by substituting the word "and" for "or."

Kelsey Tire Company asked how the criteria would apply to tires which are produced abroad in large numbers but are imported in quantities which would fall within the unit limitations of subparagraphs (c)(2)(i), (ii), and (iv) of the proposal. To make clear that the criteria are to be applied to foreign tires only insofar as they are imported in this country, subparagraphs (c)(2)(i) and (iv) have been modified to refer to "annual domestic production or importation into the United States by the tire's

manufacturer." The reference to "importation . . . by the tire's manufacturer" includes in the total all tires entering the United States for sale under the name of the manufacturer, regardless of the shipping or title arrangements made by the manufacturer with distributors. Similarly, subparagraphs (c)(2)(ii) and (iv) have been modified to clarify the status of tires purchased by brand name owners.

McCreary and Intermark argued that the unit restrictions on production of tires meeting the criteria are too restrictive and should be eliminated or eased significantly. McCreary predicted that the total number of classic car tires produced by individual manufacturers will grow, although production runs of individual designs and sizes will remain small. Intermark contended that production limitations unfairly penalize efficient manufacturers and that a new vehicle recommended size designation provision such as proposed subparagraph (c)(2)(iii) would be sufficient to define the intended class of limited production tires.

NHTSA considers the stated limitations broad enough to encompass the "classic" car tire market as it is presently constituted. With regard to the larger production runs of tires in outdated sizes, NHTSA believes that the production of tires in numbers greater than the proposed limitations is suggestive of wider availability and resulting increased competition which would make UTQG information of greater value. Further, relaxing or eliminating unit restrictions could result in the exclusion from the application of the standard of high performance or racing tires which are not recommended as original equipment. The agency believes that comparative tire grading information should be available to purchasers of tires of this type. NHTSA will monitor the limited production tire market to determine whether future market changes require revision of the 35,000 tire limitation.

Pursuant to E.O. 12044, "Improving Government Regulation," and implementing departmental guidelines, the agency has considered the effects of this amendment. It reaffirms its earlier determination that the amendment is not significant and that the effects are so minimal as not to warrant preparation of a regulatory evaluation. NHTSA has determined that these amendments will result in modest cost savings to industry and consumers, while having no appreciable effect on safety or the environment.



Because this amendment relieves a restriction and because the agency desires to minimize any possible interruption in tire production pending the effective date of this amendment, the amendment is effective immediately.

In consideration of the foregoing, 49 CFR § 575.104(c) is amended to read:

§ 575.104 Uniform tire quality grading standards.

\* \* \* \* \*

(c) *Application.*

(1) This section applies to new pneumatic tires for use on passenger cars. However, this section does not apply to deep tread, winter-type snow tires, space-saver or temporary use spare tires, tires with nominal rim diameters of 10 to 12 inches, or to limited production tires as defined in paragraph (c) (2) of this section.

(2) "Limited production tire" means a tire meeting all of the following criteria, as applicable:

(i) The annual domestic production or importation into the United States by the tire's manufacturer of tires of the same design and size as the tire does not exceed 15,000 tires;

(ii) In the case of a tire marketed under a brand name, the annual domestic purchase or importation into the United States by a brand name owner of tires of the same design and size as the tire does not exceed 15,000 tires;

(iii) The tire's size was not listed as a vehicle manufacturer's recommended tire size designation for a new motor vehicle produced in or imported into the United States in quantities greater than 10,000 during the calendar year preceding the year of the tire's manufacture; and

(iv) The total annual domestic production or importation into the United States by the tire's manufacturer, and in the case of a tire marketed under a brand name, the total annual domestic purchase or purchase for importation into the United States by the tire's brand name owner, of tires meeting the criteria of subparagraphs (c) (2) (i), (ii), and (iii) of this section, does not exceed 35,000 tires.

Tire design is the combination of general structural characteristics, materials, and tread pattern, but does not include cosmetic, identifying or other minor variations among tires.

The principal authors of this notice are Dr. F. Cecil Brenner of the Office of Automotive Ratings and Richard J. Hipolit of the Office of Chief Counsel.

Issued on March 24, 1980.

Joan Claybrook  
Administrator

**45 F.R. 23442**  
**April 7, 1980**





## PREAMBLE TO AN AMENDMENT TO PART 575

**ACTION:** Final rule.

**SUMMARY:** This notice amends the Consumer Information Regulations by deletion of the requirement that manufacturers supply information on acceleration and passing ability to vehicle first purchasers and prospective purchasers. The notice also revises the timing of manufacturers' submissions of performance data to the National Highway Traffic Safety Administration (NHTSA). These modifications, which were proposed in response to a General Motors Corporation petition for rule-making, are intended to lessen regulatory burdens on industry, while providing performance data in a manner more useful to consumers.

**EFFECTIVE DATES:** The amendment of section 575.6(d) is effective June 1, 1981. The deletion of section 575.106 is effective immediately, July 7, 1980.

**FOR FURTHER INFORMATION CONTACT:**

Ivy Baer, Office of Automotive Ratings,  
National Highway Traffic Safety  
Administration, 400 Seventh Street,  
S.W., Washington, D.C. 20590 (202-426-1740)

**SUPPLEMENTARY INFORMATION:** The Consumer Information Regulations (49 CFR Part 575) provide first purchasers and prospective purchasers with performance information relating to the safety of motor vehicles and tires. This information is intended to aid consumers in making comparative purchasing decisions and in the safe operation of vehicles. General Motors Corporation petitioned NHTSA to delete requirements for consumer information on passenger car and motorcycle stopping distance (49 CFR 575.101), passenger car tire reserve load (49 CFR 575.102), and passenger car and motorcycle acceleration and passing ability

(49 CFR 575.106), on the basis that this information is of limited value to consumers. In response to this petition, NHTSA proposed (44 FR 15748; March 15, 1979) to delete the requirement for acceleration and passing ability information and to limit the application of the tire reserve load provisions to vehicles with significant cargo capacity, thus dropping the requirement for most passenger cars. NHTSA also proposed that vehicle manufacturers submit performance data to the agency at least 90 days before model introduction, compared to the 30-day advance submission which had been required (49 CFR 575.6).

**Timing of Data Submission**

The primary purpose of the advance submission to NHTSA is to permit the agency to compile and disseminate performance data in a comparative format for use by prospective vehicle purchasers. A major criticism of the consumer information program in the past has been that comparative information reached the consumer too late in the model year to be of real value in choosing between competing vehicles. A 90-day advance submission would permit the agency to assemble and distribute comparative information early in the model year, when it would be of greatest value to consumers.

Some industry commenters questioned the need for earlier submission of data on the basis that agency delays in publishing the data will result in comparative information being available late in the model year, in spite of the earlier submission. Other manufacturers argued that consumer interest in the information is limited in any case. General Motors suggested that vehicle design changes during the model year rapidly outdate the information, further limiting its value.

However, the Center for Auto Safety (CFAS) commented that it receives numerous requests

from consumers for comparative information on motor vehicles. CFAS also pointed out the popularity of comparative motor vehicle information on the rare occasions when such information is made available by independent publishers. NHTSA has concluded that consumer interest in comparative performance information would be substantial if the information were made available in a timely manner. Further, NHTSA has determined that few running design changes during the model year are so major as to significantly affect the performance characteristics covered by the consumer information regulations.

The success of the Environmental Protection Agency in publishing its popular fuel economy guides in a timely manner indicates that publication of vehicle information by NHTSA early in the model year is practical. However, based on past experience, it appears that a 90-day advance submission is the minimum leadtime necessary for NHTSA to publish and distribute the information.

Some manufacturers indicated they may have difficulty providing accurate performance information 90 days in advance of model introduction due to the possibility of last minute design changes. However, American Motors Corporation commented that a 90-day advance submission requirement would pose no problem at new model introduction, although it would inhibit running changes during the model year. In view of the importance of supplying comparative information early in the model year, NHTSA has adopted the proposed 90-day advance submission requirement for model introduction. However, to avoid delaying the introduction of product improvements, the 30-day notice period has been retained for changes occurring during the model year.

#### **Tire Reserve Load**

In response to General Motors' petition, NHTSA proposed modifying the tire reserve load information requirement to limit its application to trucks and multipurpose passenger vehicles with a gross vehicle weight rating of 10,000 pounds or less, and to passenger cars with a maximum cargo capacity of 25 cubic feet or more. The regulation had applied to all passenger cars, but not to trucks or multipurpose passenger vehicles.

Comments from many industry and consumer sources recommended deleting the tire reserve load information requirement completely. CFAS

commented that consumer interest in tire reserve load information has been limited. Many comments from car, truck and recreational vehicle manufacturers expressed concern that presenting information on tire reserve load may encourage vehicle overloading by misleading consumers into thinking that vehicles have additional load carrying capacity. Several commenters suggested that Federal Motor Vehicle Safety Standards 110 and 120 provide the appropriate means of ensuring that vehicles are equipped with tires of adequate size and load rating.

A recent study conducted for NHTSA (Docket 79-02, Notice 1-016) indicates that tire reserve load is an important factor in preventing passenger car tire failure. Additional information is being gathered on this subject and the agency is planning to propose amendment of Federal Motor Vehicle Safety Standard 110 to require a minimum tire reserve load on passenger cars. Preliminary analysis suggests that a tire reserve load percentage of 10% or greater is necessary to provide an adequate safety margin.

NHTSA has found that presently available information is not sufficient to justify extension of the tire reserve load requirements to light trucks and multipurpose passenger vehicles at this time. However, in view of the safety implications of tire reserve load for passenger cars and in the absence of a requirement for minimum tire reserve load, NHTSA believes that information on this subject should be available to passenger car purchasers and owners. The agency has concluded that provision of tire reserve load information in its present form does not encourage vehicle overloading, since a warning against loading vehicles beyond their stated capacity must accompany the information.

For these reasons, NHTSA has determined that the existing requirement for tire reserve load information must remain in effect at least until the completion of rulemaking on the possible amendment of Federal Motor Vehicle Safety Standard 110. If the provision of tire reserve load information no longer appears necessary then, the agency will reconsider the status of tire reserve load as a consumer information item. At this time, however, NHTSA withdraws the proposal to modify the tire reserve load consumer information requirements.

#### **Acceleration and Passing Ability**

The final aspect of NHTSA's proposal was dele-



tion of acceleration and passing ability (49 CFR 575.106) from the consumer information requirements. The acceleration and passing ability provision required information on the distance and time needed to pass a truck traveling at 20 mph and at 50 mph. The passing vehicle was permitted to attain speeds of up to 35 mph and 80 mph in the respective maneuvers.

In proposing deletion of this requirement, NHTSA felt that the national interest in energy conservation had substantially diminished consumer demand for rapid acceleration capability. Further, the high speed driving permitted by the test procedures appeared to contradict the safety and energy saving policies behind the national 55-mph speed limit. Commenters on the proposal, including American Motors, CFAS, General Motors and Volkswagen of America, unanimously agreed that the acceleration and passing ability provision was no longer of interest to consumers and had become inconsistent with national goals. Section 575.106 has, therefore, been deleted from the consumer information regulations.

NHTSA's regulatory evaluation, conducted pursuant to E.O. 12044, "Improving Government Regulations" and departmental guidelines, indicates that the amendments are not significant. They decrease the regulatory burden on industry, while having no appreciable negative impact on safety. A copy of the regulatory evaluation can be obtained from the Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. Also, the amendments will have no measurable effect on the environment.

Because the amendments as they pertain to acceleration and passing ability relieve a restriction, and to avoid any unnecessary costs in complying with this requirement, the deletion of section 575.106 is effective immediately. So that useful performance information can be provided to consumers for model year 1982 vehicles, the amendment to section 575.6 is effective June 1, 1981.

In consideration of the foregoing, 49 CFR Part

575, Consumer Information Regulations, is amended as follows:

- 1. Section 575.6(d) is amended to read:  
§575.6 Requirements

\* \* \* \* \*

(d) In the case of all sections of Subpart B, other than §575.104, as they apply to information submitted prior to new model introduction, each manufacturer of motor vehicles shall submit to the Administrator 10 copies of the information specified in Subpart B of this part that is applicable to the vehicles offered for sale, at least 90 days before it is first provided for examination by prospective purchasers pursuant to paragraph (c) of this section. In the case of §575.104, and all other sections of Subpart B as they apply to post-introduction changes in information submitted for the current model year, each manufacturer of motor vehicles, each brand name owner of tires, and each manufacturer of tires for which there is no brand name owner shall submit to the Administrator 10 copies of the information specified in Subpart B of this part that is applicable to the vehicles or tires offered for sale, at least 30 days before it is first provided for examination by prospective purchasers pursuant to paragraph (c) of this section.

- 2. Section 575.106 is deleted.

The principal authors of this proposal are Ivy Baer of the Office of Automotive Ratings and Richard J. Hipolit of the Office of the Chief Counsel.

Issued on July 7, 1980.

Joan Claybrook  
Administrator

45 FR 47152  
July 14, 1980



## **PREAMBLE TO AN AMENDMENT TO PART 575**

### **Consumer Information Regulations Uniform Tire Quality Grading (Docket No. 25; Notice 4)**

**ACTION:** Final rule.

**SUMMARY:** This notice amends the Uniform Tire Quality Grading (UTQG) Standards to provide for the testing of metric tires, tires with inflation pressures measured in kilopascals. Since the original UTQG test requirements were written prior to the introduction of metric tires and specified inflation pressures measured in pounds per square inch, modification of the regulation is now necessary to identify inflation pressures applicable to metric tires. The notice also makes technical changes in the UTQG traction test procedure to facilitate efficient use of test facilities.

**EFFECTIVE DATE:** The amendments are effective immediately.

**FOR FURTHER INFORMATION CONTACT:**

Dr. F. Cecil Brenner, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590, 202-426-1740

**SUPPLEMENTARY INFORMATION:** The UTQG standards prescribe test procedures for evaluation of the treadwear, traction, and temperature resistance properties of passenger car tires. Grades based on these are used by consumers to evaluate the relative performance of competing tire lines. Test procedures for all three performance categories were established specifying inflation pressures in pounds per square inch.

Following the introduction of metric tires with inflation pressures measured in kilopascals, the National Highway Traffic Safety Administration (NHTSA) recognized the need to add metric inflation pressures to the UTQG test procedures. The agency proposed (44 F.R. 56389; October 1, 1979; Notice 34) that for purposes of traction testing,

metric tires would be inflated and tire loads determined using a prescribed inflation pressure of 180 kPa. Under the proposal, other tires would continue to be tested at an inflation pressure of 24 psi. NHTSA's notice also proposed modification of the temperature resistance test procedure to provide, in the case of metric tires, for use of inflation pressures 60 kPa less than the tires' maximum permissible inflation pressure.

In response to comments, NHTSA modified the original proposal (45 F.R. 35408; May 27, 1980; Notice 40) to include treadwear testing in the proposed modifications and to incorporate a table indicating treadwear, traction, and temperature resistance test inflation pressures for tires with various maximum permissible inflation pressures in kilopascals and pounds per square inch. In the proposed table, different test inflation pressures were specified for tires with differing maximum permissible inflation pressures.

The agency also proposed, in Notice 34, modification of the traction test procedure to permit the adjustment of candidate tire test results with standard tire results obtained either before or after the candidate tire test sequence, so long as all data to be compared were collected within the same two-hour period. This change was intended to promote efficient use of the traction test facilities by permitting data from more than one candidate tire test sequence to be adjusted by comparison with the same standard tire sequence.

Upon examination of additional data, NHTSA concluded that a three-hour period could be employed without affecting the accuracy of the test results. Use of a three-hour period would permit more than one candidate tire test sequence to be run both before and after the corresponding standard tire test sequence. A three-hour period for comparative testing was proposed in Notice 40. Having received no negative comments on the



traction test sequence proposal as stated in that notice, NHTSA has determined that the amendment will be adopted as proposed.

On the proposed changes to provide for testing of metric tires, Goodyear Tire & Rubber Company noted that the table of test inflation pressures proposed in Notice 40 calls for variations in the prescribed test inflation pressure depending on the maximum permissible inflation pressure of the tested tire. The original traction procedure specified a single test inflation pressure for all tires. Goodyear expressed concern that such a change could affect test results and, consequently, tire grades, and require wasteful additional testing to confirm grades already assigned. Goodyear recommended that NHTSA adopt the amendment proposed in Notice 34 that all metric tires be tested using the inflation pressure 180 kPa and all other tires be tested using the original 24 psi inflation pressure.

NHTSA agrees that unnecessary costs associated with the UTQG Standard should be avoided. For this reason, the agency has determined that reference to traction testing will be deleted from the table of test inflation pressures, and the addition of the metric traction test inflation pressure of 180 kPa proposed in Notice 34 will be adopted instead. Those aspects of Notice 40 pertaining to treadwear and temperature resistance testing of metric tires will be adopted as proposed in that notice.

Pursuant to Executive Order 12044, "Improving Government Regulations," and implementing Departmental guidelines, the agency has considered the effects of these amendments. NHTSA reaffirms its earlier determination that the amendments are not significant and that the effects are so minimal as not to warrant preparation of a regulatory evaluation. NHTSA has determined these amendments will result in modest cost savings to industry and consumers, while having no appreciable effect on safety or the environment.

Because these amendments will facilitate the efficient and accurate completion of testing presently underway, the amendments are effective immediately.

In consideration of the foregoing, 49 CFR §575.104 is amended as follows:

1. In section 575.104(e)(2)(ii) by substitution of

the words "the applicable pressure specified in Table 1 of this section," in place of the words "an inflation pressure 8 pounds per square inch less than its maximum permissible inflation pressure."

2. In section 575.104 (f) (2) (i) (B) and (D) by addition of the words, "or, in the case of a tire with inflation pressure measured in kilopascals, to 180 kPa" following the words "to 24 psi."

3. In section 575.104(f)(2)(vii) by addition of the following sentence, at the end thereof: "The standard tire traction coefficient so determined may be used in the computation of adjusted traction coefficients for more than one candidate tire."

4. In section 575.104 (f)(2)(viii) by addition of the words, "or, on the case of a tire with inflation pressure measured in kilopascals, the load specified at 180 kPa," following the words "at 24 psi," and by addition of the sentences, "Candidate tire measurements may be taken either before or after the standard tire measurements used to compute the standard tire traction coefficient. Take all standard tire and candidate tire measurements used in computation of a candidate tire's adjusted traction coefficient within a single three hour period" following the first sentence thereof.

5. In section 575.104 (g) (1) by substitution of the words "the applicable pressure specified in Table 1 of this section," in place of the words "2 pounds per square inch less than its maximum permissible inflation pressure."

6. In section 575.104(g)(3) by substitution of the words "the applicable pressure specified in Table 1 of this section," in place of the words "2 pounds per square inch less than the maximum permissible inflation pressure."

7. In section 575.104(g)(6) by substitution of the words "applicable inflation pressure specified in Table 1 of this section," in place of the words "inflation pressure that is 8 pounds per square inch less than the tire's maximum permissible inflation pressure."

8. In section 575.104(g)(8) by substitution of the words "the applicable pressure specified in Table 1 of this section," in place of the words "2 pounds per square inch less than that the tire's maximum permissible inflation pressure."

9. By addition of the following table at the conclusion of the text of that section:

Table 1.—Test Inflation Pressures

Maximum permissible inflation pressure	32 lb/in <sup>2</sup>	36 lb/in <sup>2</sup>	40 lb/in <sup>2</sup>	240 kPa	280 kPa	300 kPa
Pressure to be used in tests for treadwear and in determination of tire load for temperature resistance testing.	24	28	32	180	220	180
Pressure to used for all aspects of temperature resistance testing other than determination of tire load.	30	34	38	220	260	220

The principal authors of this notice are Dr. F. Cecil Brenner of Office of Automotive Ratings and Richard J. Hipolit of the Office of Chief Counsel.

Issued on October 15, 1980.

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Joan Claybrook  
Administrator

45 FR 70273  
October 23, 1980





## PART 575—CONSUMER INFORMATION

### SUBPART A—GENERAL

#### § 575.1 Scope.

This part contains Federal Motor Vehicle Consumer Information Regulations established under section 112(d) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1401(d)) (hereinafter “the Act”).

#### § 575.2 Definitions.

(a) *Statutory definitions.* All terms used in this part that are defined in section 102 of the Act are used as defined in the Act.

(b) *Motor Vehicle Safety Standard definitions.* Unless otherwise indicated, all terms used in this part that are defined in the Motor Vehicle Safety Standards, Part 571 of this subchapter (hereinafter “The Standards”) are used as defined in the Standards without regard to the applicability of a standard in which a definition is contained.

(c) *Definitions used in this part.*

“Brake power unit” means a device installed in a brake system that provides the energy required to actuate the brakes, either directly or indirectly through an auxiliary device, with the operator action consisting only of modulating the energy application level.

“Lightly loaded vehicle weight” means—

(1) For a passenger car, unloaded vehicle weight plus 300 pounds (including driver and instrumentation), with the added weight distributed in the front seat area.

(2) For a motorcycle, unloaded vehicle weight plus 200 pounds (including driver and instrumentation), with added weight distributed on the saddle and in saddle bags or other carrier.

“Maximum loaded vehicle weight” is used as defined in Standard No. 110.

“Maximum sustained vehicle speed” means that speed attainable by accelerating at maximum rate from a standing start for 1 mile.

“Skid number” means the frictional resistance measured in accordance with American Society for Testing and Materials Method E-274 at 40 miles per hour, omitting water delivery as specified in paragraph 7.1 of that Method.

#### § 575.3 Matter incorporated by reference.

The incorporation by reference provisions of § 571.5 of this subchapter applies to this part.

#### § 575.4 Application.

(a) *General.* Except as provided in paragraphs (b) through (d) of this section, each section set forth in Subpart B of this part applies according to its terms to motor vehicles and tires manufactured after the effective date indicated.

(b) *Military vehicles.* This part does not apply to motor vehicles or tires sold directly to the Armed Forces of the United States in conformity with contractual specifications.

(c) *Export.* This part does not apply to motor vehicles or tires intended solely for export and so labeled or tagged.

(d) *Import.* This part does not apply to motor vehicles or tires imported for purposes other than resale.

#### § 575.5 Separability.

If any section established in this part or its application to any person or circumstances is held invalid, the remainder of the part and the application of that section to other persons or circumstances is not affected thereby.

#### § 575.6 Requirements.

(a) At the time a motor vehicle is delivered to the first purchaser for purposes other than resale, the manufacturer of that vehicle shall provide to that purchaser, in writing and in the English language, the information specified in Subpart B of this part

that is applicable to that vehicle and its tires. The document provided with a vehicle may contain more than one table, but the document must either (1) clearly and unconditionally indicate which of the tables apply to the vehicle with which it is provided, or (2) contain a statement on its cover referring the reader to the vehicle certification label for specific information concerning which of the tables apply to that vehicle. If the manufacturer chooses option (2), the vehicle certification label shall include such specific information.

*Example 1:* Manufacturer X furnishes a document containing several tables, which apply to various groups of vehicles that it produces. The document contains the following notation on its front page: "The information that applies to this vehicle is contained in Table 5." The notation satisfies the requirement.

*Example 2:* Manufacturer Y furnishes a document containing several tables as in Example 1, with the following notation on its front page:  
Information applies as follows:  
Model P. 6-cylinder engine—Table 1.  
Model P. 8-cylinder engine—Table 2.  
Model Q—Table 3.

This notation does not satisfy the requirement, since it is conditioned on the model or the equipment of the vehicle with which the document is furnished, and therefore additional information is required to select the proper table.

(b) At the time a motor vehicle tire is delivered to the first purchaser for a purpose other than resale, the manufacturer of that tire, or in the case of a tire marketed under a brand name, the brand name owner, shall provide to that purchaser the information specified in Subpart B of this part that is applicable to that tire.

(c) Each manufacturer of motor vehicles, each brand name owner of tires, and each manufacturer of tires for which there is no brand name owner shall provide for examination by prospective purchasers, at each location where its vehicles or tires are offered for sale by a person with whom the manufacturer or brand name owner has a contractual, proprietary, or other legal relationship, or by a person who has such a relationship with a distributor of the manufacturer or brand name owner concerning the vehicle or tire in question, the information specified in Subpart B of this part that is applicable to each of the vehicles or tires offered for sale at that location. The information shall be provided without charge and in sufficient quantity to be available for retention by prospective purchasers or sent by mail to a prospective purchaser upon his request. With respect to newly introduced vehicles or tires, the information shall be provided for examination by prospective purchasers not later than the day on which the manufacturer or brand name owner first authorizes those vehicles or tires to be put on general public display and sold to consumers.

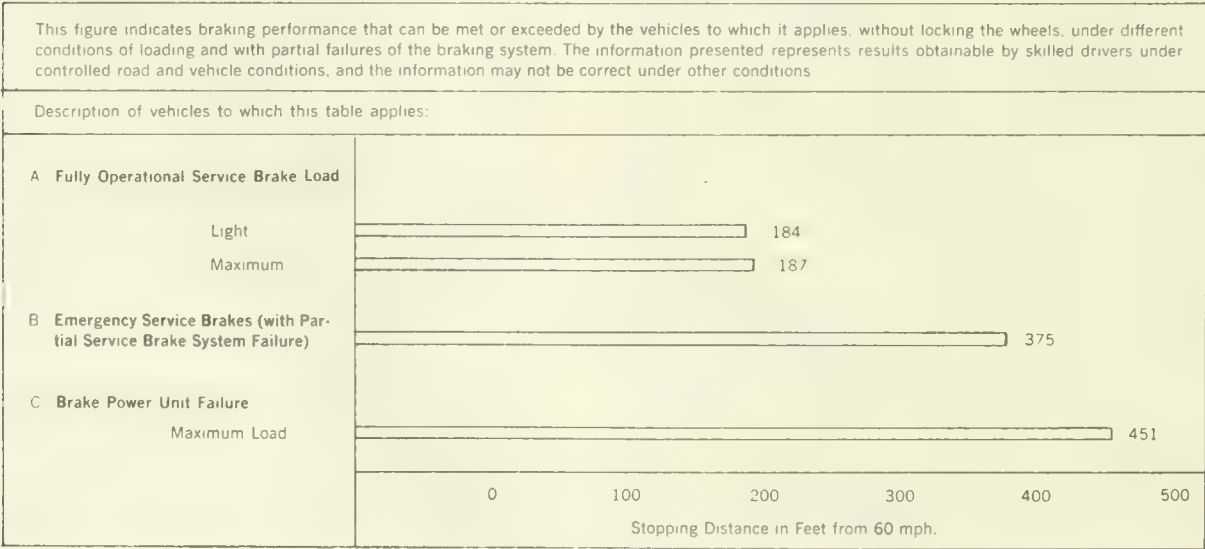


FIGURE 1



[(d) In the case of all sections of Subpart B, other than § 575.104, as they apply to information submitted prior to new model introduction, each manufacturer of motor vehicles shall submit to the Administrator 10 copies of the information specified in Subpart B of this part that is applicable to the vehicles offered for sale, at least 90 days before it is first provided for examination by prospective purchasers pursuant to paragraph (c) of this section. In the case of § 575.104, and all other sections of Subpart B as they apply to post-introduction changes in information submitted for the current model year, each manufacturer of motor vehicles, each brand name owner of tires, and each manufacturer of tires for which there is no brand name owner shall submit to the Administrator 10 copies of the information specified in Subpart B of this part that is applicable to the vehicles or tires offered for sale, at least 30 days before that information is first provided for examination by prospective purchasers pursuant to paragraph (c) of this section. (45 F.R. 47152—July 14, 1980. Effective: 6/1/81.)]

#### § 575.7 Special vehicles.

A manufacturer who produces vehicles having a configuration not available for purchase by the general public need not make available to ineligible purchasers, pursuant to § 575.6(c), the information for those vehicles specified in Subpart B of this part, and shall identify those vehicles when furnishing the information required by § 575.6(d).

### SUBPART B—CONSUMER INFORMATION ITEMS

#### § 575.101 Vehicle stopping distance.

(a) *Purpose and scope.* This section requires manufacturers of passenger cars and motorcycles to provide information on vehicle stopping distances under specified speed, brake, loading and pavement conditions.

(b) *Application.* This section applies to passenger cars and motorcycles manufactured on or after January 1, 1970.

(c) *Required information.* Each manufacturer shall furnish the information in (1) through (5) below, in the form illustrated in Figure 1, except that with respect to (2) and (3) below, a manufacturer whose total motor vehicle production does not exceed 500 annually is only required to furnish performance information for the loaded condition. Each motorcycle in the group to which the information applies shall be capable, under the conditions specified in paragraph (d), and utilizing the procedures specified in paragraph (e), of performing at least as well as the information indicates. Each passenger car in the group to which the information applies shall be capable of per-

forming at least as well as the information indicates, under the test conditions and procedures specified in S6 and S7 of Standard No. 105–75 of this chapter (49 CFR 571.105–75) or, in the case of passenger cars manufactured before January 1, 1977, and at the option of the manufacturer, under the conditions specified in paragraph (d) of this section and the procedures specified in Paragraph (e) of this section.

If a vehicle is unable to reach the speed of 60 miles per hour (mph), the maximum sustained vehicle speed shall be substituted for the 60 mph speed in the requirements specified below, and in the presentation of information as in Figure 1, with an asterisked notation in essentially the following form at the bottom of the figure: "The maximum speed attainable by accelerating at maximum rate from a standing start for one mile."

The weight requirements indicated in (c), (2), (3), and (4) of this section are modified for motorcycles (and at the option of the manufacturer, in the case of passenger cars manufactured before January 1, 1977) by the fuel tank condition specified in (d) (4) below.

(1) *Vehicle description.* The group of vehicles to which the table applies, identified in the terms by which they are described to the public by the manufacturer.

(2) *Minimum stopping distance with fully operational service brake system.* The minimum stopping distance attainable, expressed in feet, from 60 mph, using the fully operational service brake system—

(A) In the case of a motorcycle, at lightly loaded and maximum loaded vehicle weight; and

(B) In the case of a passenger car, at lightly loaded vehicle weight and at gross vehicle weight rating (GVWR), except for a passenger car manufactured before January 1, 1977, and tested, at the option of the manufacturer, under the conditions and procedures of paragraphs (d) and (e) of this section, which passenger car shall be tested at lightly loaded vehicle weight and at maximum loaded vehicle weight.

(3) *Minimum stopping distance with partially failed service brake system.* (Applicable only to passenger cars with more than one service brake subsystem.) The minimum stopping distance attainable using the service brake control, expressed in feet, from 60 mph, for the most adverse combination of GVWR or lightly loaded vehicle weight and partial failure as specified in S5.1.2 of Standard No. 105–75 of this chapter. However, a passenger car manufactured before January 1, 1977, and tested, at the option of the manufacturer, under the conditions and procedures of paragraphs (d) and (e) of this



section, shall be tested at maximum loaded vehicle weight instead of GVWR.

(4) *Minimum stopping distance with in-operative brake power assist unit or brake power unit.* (Applicable only to passenger cars equipped with brake power assist unit or brake power unit.) The minimum stopping distance, expressed in feet, from 60 mph, using the service brake system, tested in accordance with the requirements of S5.1.3 of Standard No. 105-75 of this chapter. However, in the case of a passenger car manufactured before January 1, 1977, vehicle loading may, at the option of the manufacturer, be maximum loaded vehicle weight in place of the GVWR loading specified under S5.1.3 of Standard No. 105-75.

(5) *Notice.* The following notice: "This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system. The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions."

(d) *Conditions.* The data provided in the format of Figure 1 shall represent a level of performance that can be equalled or exceeded by each vehicle in the group to which the table applies, under the following conditions, utilizing the procedures set forth in (e) below:

(1) Stops are made without lock-up of any wheel, except for momentary lock-up caused by an automatic skid control device.

(2) The tire inflation pressure and other relevant component adjustments of the vehicle are made according to the manufacturer's published recommendations.

(3) For passenger cars, brake pedal force does not exceed 150 pounds for any brake application. For motorcycles, hand brake lever force applied 1¼ inches from the outer end of the lever does not exceed 55 pounds, and foot brake pedal force does not exceed 90 pounds.

(4) Fuel tank is filled to any level between 90 and 100 percent of capacity.

(5) Transmission is in neutral, or the clutch disengaged, during the entire deceleration.

(6) The vehicle begins the deceleration in the center of a straight roadway lane that is 12 feet wide, and remains in the lane throughout the deceleration.

(7) The roadway lane has a grade of zero percent, and the road surface has a skid number of 81, as measured in accordance with American Society for Testing and Materials (ASTM) Method E-274-70 (as revised July, 1974) at 40 mph, omitting the water delivery specified in paragraphs 7.1 and 7.2 of that Method.

(8) All vehicle openings (doors, windows, hood, trunk, convertible tops, etc.) are in the closed position except as required for instrumentation purposes.

(9) Ambient temperature is between 32°F and 100°F.

(10) Wind velocity is zero.

(e) *Procedures.*

(1) *Burnish.*

(i) Passenger cars. Burnish brakes once prior to first stopping distance test by conducting 200 stops from 40 mph (or maximum sustained vehicle speed if the vehicle is incapable of reaching 40 mph) at a deceleration rate of 12 fpsps in normal driving gear, with a cooling interval between stops, accomplished by driving at 40 mph for a sufficient distance to reduce brake temperature to 250°F, or for one mile, whichever occurs first. Readjust brakes according to manufacturer's recommendations after burnishing.

(ii) Motorcycles. Adjust and burnish brakes in accordance with manufacturer's recommendations. Where no burnishing procedures have been recommended by the manufacturer, follow the procedures specified above for passenger cars, except substitute 30 mph for 40 mph and 150° F for 250°F, and maintain hand lever force to foot lever force ratio of approximately 1 to 2.

(2) Ensure that the temperature of the hot-test service brake is between 130°F and 150°F prior to the start of all stops (other than burnishing stops), as measured by plug-type thermocouples installed according to SAE Recommended Practice J843a, June 1966.

(3) Measure the stopping distance as specified in (c) (2), (3), and (4), from the point of application of force to the brake control to the point at which the vehicle reaches a full stop.

## § 575.102 Tire reserve load.

(a) *Purpose and scope.* This section requires manufacturers of passenger cars to provide information as to the difference, expressed as a percentage of the tire load rating, between the load imposed on a tire at maximum loaded vehicle weight and the tire load rating set forth in Federal Motor Vehicle Safety Standard No. 109, the tire size designations recommended for use on the vehicle, and the recommended tire inflation pressures under maximum loading conditions.

(b) *Application.* This section applies to passenger cars manufactured on or after January 1, 1970.

(c) *Required information.* Each manufacturer shall furnish the information in (1) through (5) below, in the form illustrated in Figure 1. The table that is provided for a specific vehicle shall contain only information that is applicable to that vehicle. The tire reserve load percentage given for each tire size designation or combination of tire size designations shall not exceed the lowest value that is correct for all the vehicles in the group to which the table applies.

(1) *Vehicle description.* The group of vehicles to which the table applies, identified in the terms by which they are described to the public by the manufacturer.

(2) *Recommended tire size designations.* All tire size designations and combinations of tire size designations, as listed in Standard No. 109, recommended by the manufacturer for use on the vehicle.

(3) *Recommended inflation pressure for maximum loaded vehicle weight.* Vehicle manufacturer's recommended inflation pressure for maximum loaded vehicle weight, for each recommended tire size designation.

(4) *Tire reserve load percentage.* The tire reserve load percentage for the vehicle, determined according to paragraph (d), for each of the tire size designations or combinations of tire size designations recommended by the manufacturer.

(5) *Warning.* The following statement, placed in proximity to the table:

"WARNING. Failure to maintain the recommended tire inflation pressure or to increase tire pressure as recommended when operating at maximum loaded vehicle weight, or loading the vehicle beyond the capacities specified on the tire placard affixed to the vehicle, may result in unsafe operating conditions due to premature tire failure, unfavorable handling characteristics, and excessive tire wear. The tire reserve load percentage is a measure of tire capacity, not of vehicle capacity. Loading beyond the specified vehicle capacity may result in failure of other vehicle components."

(d) *Determination of tire reserve load percentage.* The tire reserve load percentage for a vehicle, required by paragraph (c), shall be determined as follows:

(1) Determine  $W_1$ , the vehicle maximum load on the tire, for the front and rear tires respectively. These figures are determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing that share by two.

(2) Find  $W_2$ , the load rating for each tire as installed, set forth in Standard No. 109, using the vehicle manufacturer's recommended inflation pressure for maximum loaded vehicle weight.

(3) Calculate the tire reserve load percentage for each tire as:

$$\frac{W_2 - W_1}{W_2} \times 100$$

(4) The tire reserve load percentage for the vehicle is the lowest of the percentages calculated in (3) for each tire on the vehicle.

## § 575.103 Truck-camper loading.

(a) *Scope.* This section requires manufacturers of trucks that are capable of accommodating slide-in campers to provide information on the cargo weight rating and the longitudinal limits within which the center of gravity for the cargo weight rating should be located.

(b) *Purpose.* The purpose of this section is to provide information that can be used to reduce



overloading and improper load distribution in truck-camper combinations, in order to prevent accidents resulting from the adverse effects of these conditions on vehicle steering and braking.

(c) *Application.* This section applies to trucks that are capable of accommodating slide-in campers.

(d) *Definitions.* “Camper” means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

“Cargo weight rating” means the value specified by the manufacturer as the cargo-carrying capacity, in pounds, of a vehicle, exclusive of the weight of occupants, computed as 150 pounds times the number of designated seating positions.

“Slide-in camper” means a camper having a roof, floor and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

(e) *Requirements.* Except as provided in paragraph (f) of this section each manufacturer of a truck that is capable of accommodating a slide-in camper shall furnish the information specified in (1) through (5) below:

(1) A picture showing the manufacturer’s recommended longitudinal center of gravity zone for the cargo weight rating in the form illustrated in Figure 1. The boundaries of the zone shall be such that when a slide-in camper equal in weight to the truck’s cargo weight rating is installed, no gross axle weight rating of the truck is exceeded. Until October 1, 1973 the phrase “Aft End of Cargo Area” may be used in Figure 1 instead of “Rear End of Truck Bed”.

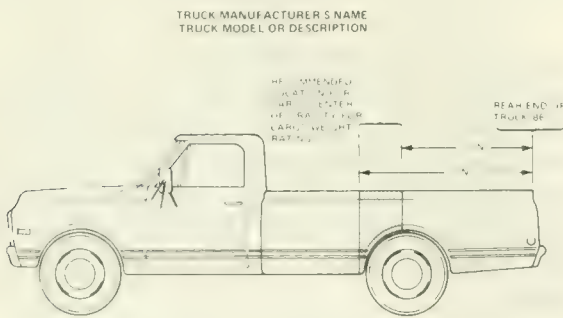


FIGURE 1 TRUCK LOADING INFORMATION

(2) The truck’s cargo weight rating.

(3) The statements: “When the truck is used to carry a slide-in camper, the total cargo load of the truck consists of the manufacturer’s camper weight figure, the weight of installed additional camper equipment not included in the manufacturer’s camper weight figure, the weight of camper cargo, and the weight of passengers in the camper. The total cargo load should not exceed the truck’s cargo weight rating and the camper’s center of gravity should fall within the truck’s recommended center of gravity zone when installed.” Until October 1, 1973 the phrase “total load” may be used instead of “total cargo load”.

(4) A picture showing the proper match of a truck and slide-in camper in the form illustrated in Figure 2.

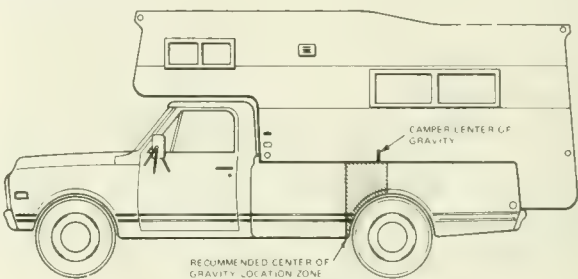


FIGURE 2 EXAMPLE OF PROPER TRUCK AND CAMPER MATCH

(5) The statements: “Secure loose items to prevent weight shifts that could affect the balance of your vehicle. When the truck camper is loaded, drive to a scale and weigh on the front and on the rear wheels separately to determine axle loads. Individual axle loads should not exceed either of the gross axle weight ratings (GAWR). The total of the axle loads should not exceed the gross vehicle weight rating (GVWR). These ratings are given on the vehicle certification label that is located on the left side of the vehicle, normally the dash, hinge pillar, door latch post, or door edge next to the driver. If weight ratings are exceeded, move or remove items to bring all weights below the ratings.”

(f) If a truck would accommodate a slide-in camper but the manufacturer of the truck recommends that the truck not be used for that purpose, the information specified in paragraph (e) shall not be provided but instead the manufacturer shall provide a statement that the truck should not be used to carry a slide-in camper.



#### § 575.104 Uniform Tire Quality Grading Standards.

(a) *Scope.* This section requires motor vehicle and tire manufacturers and tire brand name owners to provide information indicating the relative performance of passenger car tires in the areas of treadwear, traction, and temperature resistance.

(b) *Purpose.* The purpose of this section is to aid the consumer in making an informed choice in the purchase of passenger car tires.

(c) *Application.* This section applies to new pneumatic tires for use on passenger cars manufactured after 1948. However, this section does not apply to deep tread, winter-type snow tires or to space-saver or temporary-use spare tires. Further, this section does not apply to tires with nominal rim diameters of 10 to 12 inches.

(d) *Requirements.*

(1) *Information.*

(i) Each manufacturer of tires, or in the case of tires marketed under a brand name, each brand name owner, shall provide grading information for each tire of which he is the manufacturer or brand name owner in the manner set forth in paragraphs (d) (1) (i) (A) and (d) (1) (i) (B) of this section. The grades for each tire shall be only those specified in paragraph (d) (2) of this section. Each tire shall be able to achieve the level of performance represented by each grade with which it is labeled. An individual tire need not, however, meet further requirements after having been subjected to the test for any one grade.

(A) Except for a bias-ply tire manufactured prior to October 1, 1979, and April 1, 1980, and a radial-ply tire manufactured prior to October 1, 1980, each tire shall be graded with the words, letters, symbols, and figures specified in paragraph (d) (2) of this section, permanently molded into or onto the tire sidewall between the tire's maximum section width and shoulder in accordance with one of the methods in Figure 1.

[(B) (1) Each tire manufactured before October 1, 1980, other than a tire sold as original equipment on a new vehicle, shall have affixed to its tread surface in a manner such that it is not easily removable a label containing its grades and other information

in the form illustrated in Figure 2, Part II, bearing the heading "DOT QUALITY GRADES." The treadwear grade attributed to the tire shall be either imprinted or indelibly stamped on the label adjacent to the description of the treadwear grade. The label shall also depict all possible grades for traction and temperature resistance. The traction and temperature resistance performance grades attributed to the tire shall be indelibly circled. However, each tire labeled in conformity with the requirements of paragraph (d) (1) (i) (B) (2) of this section need not comply with the provisions of this paragraph.

(2) Each tire manufactured on or after October 1, 1980, other than a tire sold as original equipment on a new vehicle, shall have affixed to its tread surface so as not to be easily removable a label or labels containing its grades and other information in the form illustrated in Figure 2, Parts I and II. The treadwear grade attributed to the tire shall be either imprinted or indelibly stamped on the label containing the material in Part I of Figure 2, directly to the right of or below the word "TREADWEAR". The traction and temperature resistance performance grades attributed to the tire shall be indelibly circled in an array of the potential grade letters (ABC) directly to the right of or below the words "TRACTION" and "TEMPERATURE" in Part I of Figure 2. The words "TREADWEAR," "TRACTION," and "TEMPERATURE," in that order, may be laid out vertically or horizontally. The text part of Part II of Figure 2 may be printed in capital letters. The text of Part I and the text of Part II of Figure 2 need not appear on the same label, but the edges of the two texts must be positioned on the tire tread so as to be separated by a distance of no more than one inch. If the text of Part I and the text of Part II are placed on separate labels, the notation "See EXPLANATION OF DOT QUALITY GRADES" shall be added to the bottom of the Part I text, and the words "EXPLANATION OF DOT QUALITY GRADES" shall appear at the top of the

Part II text. The text of Figure 2 shall be oriented on the tire tread surface with lines of type running perpendicular to the tread circumference. If a label bearing a tire size designation is attached to the tire tread surface and the tire size designation is oriented with lines of type running perpendicular to the tread circumference, the text of Figure 2 shall read in the same direction as the tire size designation. (44 F.R. 68475—November 29, 1979. Effective: 12/1/79)]

(ii) In the case of information required in accordance with § 575.6(c) to be furnished to prospective purchasers of motor vehicles and tires, each vehicle manufacturer and each tire manufacturer or brand name owner shall as part of that information list all possible grades for traction and temperature resistance, and restate verbatim the explanations for each performance area specified in Figure 2. The information need not be in the same format as in Figure 2. In the case of a tire manufacturer or brand name owner, the information must indicate clearly and unambiguously the grade in each performance area for each tire of that manufacturer or brand name owner offered for sale at the particular location.

(iii) In the case of information required in accordance with § 575.6(a) to be furnished to the first purchaser of a new motor vehicle, other than a motor vehicle equipped with bias-ply tires manufactured prior to [October 1, 1979, and April 1, 1980, and a radial-ply tire manufactured prior to October 1, 1980,] each manufacturer of motor vehicles shall as part of the information list all possible grades for traction and temperature resistance and restate verbatim the explanation for each performance area specified in Figure 2. The information need not be in the format of Figure 2, but it must contain a statement referring the reader to the tire sidewall for the specific tire grades for the tires with which the vehicle is equipped.

(2) *Performance.*

(i) *Treadwear.* Each tire shall be graded for treadwear performance with the word "TREADWEAR" followed by a number of two of three digits representing the tire's

grade for treadwear, expressed as a percentage of the NHTSA nominal treadwear value, when tested in accordance with the conditions and procedures specified in paragraph (e) of this section. Treadwear grades shall be multiples of 10 (e.g., 80, 150).

(ii) *Traction.* Each tire shall be graded for traction performance with the word "TRACTION," followed by the symbols C, B, or A (either asterisks or 5-pointed stars) when the tire is tested in accordance with the conditions and procedures specified in paragraph (f) of this section.

(A) The tire shall be graded C when the adjusted traction coefficient is either:

(1) 0.38 or less when tested in accordance with paragraph (f) (2) of this section on the asphalt surface specified in paragraph (f) (1) (i) of this section, or

(2) 0.26 or less when tested in accordance with paragraph (f) (2) of this section on the concrete surface specified in paragraph (f) (1) (i) of this section.

(B) The tire may be graded B only when its adjusted traction coefficient is both:

(1) More than 0.38 when tested in accordance with paragraph (f) (2) of this section on the asphalt surface specified in paragraph (f) (1) (i) of this section, and

(2) More than 0.26 when tested in accordance with paragraph (f) (2) of this section on the concrete surface specified in paragraph (f) (1) (i) of this section.

(C) The tire may be graded A only when its adjusted traction coefficient is both:

(1) More than 0.47 when tested in accordance with paragraph (f) (2) of this section on the asphalt surface specified in paragraph (f) (1) (i) of this section, and

(2) More than 0.35 when tested in accordance with paragraph (f) (2) of this section on the concrete surface specified in paragraph (f) (1) (i) of this section.

(iii) *Temperature resistance.* Each tire shall be graded for temperature resistance performance with the word "TEMPERATURE" followed by the letter A, B, or C, based on its performance when the tire is tested in accordance with the procedures specified in paragraph (g)



of this section. A tire shall be considered to have successfully completed a test stage in accordance with this paragraph if, at the end of the test stage, it exhibits no visual evidence of tread, sidewall, ply, cord, innerliner or bead separation, chunking, broken cords, cracking or open splices as defined in § 571.109 of this chapter, and the tire pressure is not less than the pressure specified in paragraph (g) (1) of this section.

(A) The tire shall be graded C if it fails to complete the 500 rpm test stage specified in paragraph (g) (9) of this section.

(B) The tire may be graded B only if it successfully completes the 500 rpm test stage specified in paragraph (g) (9) of this section.

(C) The tire may be graded A only if it successfully completes the 575 rpm test stage specified in paragraph (g) (9) of this section.

(e) *Treadwear grading conditions and procedures.*—(1) *Conditions.* (i) Tire treadwear performance is evaluated on a specific roadway course approximately 400 miles in length, which is established by the NHTSA both for its own compliance testing and for that of regulated persons. The course is designed to produce treadwear rates that are generally representative of those encountered in public use for tires of differing construction types. The course and driving procedures are described in Appendix A to this section.

(ii) Treadwear grades are evaluated by first measuring the performance of a candidate tire on the government test course, and then correcting the projected mileage obtained to account for environmental variations on the basis of the performance of course monitoring tires of the same general construction type (bias, bias-belted, or radial) run in the same convoy. The three types of course monitoring tires are made available by the NHTSA at Goodfellow Air Force Base, San Angelo, Tex., for purchase by any persons conducting tests at the test course.

(iii) In convoy tests each vehicle in the same convoy, except for the lead vehicle, is throughout the test within human eye range of the vehicle immediately ahead of it.

(iv) A test convoy consists of no more than four passenger cars, each having only rear-wheel drive.

(v) On each convoy vehicle, all tires are mounted on identical rims: either a “test rim” as defined with respect to that tire in paragraph S3 of Standard No. 109 (§ 571.109 of this chapter) which is of the width listed for the applicable tire size designation under the words “test rim width” in Table I of the Appendix to Standard No. 109, or such a “test rim” having a width within  $-0 + 0.50$  inches of the width listed.

(2) *Treadwear grading procedure.* (i) Equip a convoy with course monitoring and candidate tires of the same construction type. Place four course monitoring tires on one vehicle. On each other vehicle, place four candidate tires that are identical with respect to with identical size designations. On each axle, manufacturer and line.

[(ii) Inflate each candidate and each course monitoring tire the applicable pressure in Table 1 of this section. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80)]

(iii) Load each vehicle so that the load on each course monitoring and candidate tire is 85 percent of the load specified in Appendix A of § 571.109 of this chapter (Standard No. 109) at the inflation pressure specified in paragraph (e) (2) (ii) of this section.

(iv) Adjust wheel alignment to that specified by the vehicle manufacturer.

(v) Subject candidate and course monitoring tires to “break-in” by running the tires in convoy for two circuits of the test roadway (800 miles). At the end of the first circuit, rotate each vehicle’s tires by moving each front tire to the same side of the rear axle and each rear tire to the opposite side of the front axle.

(vi) After break-in, allow the tires to cool to the inflation pressure specified in paragraph (e) (2) (ii) of this section or for 2 hours, whichever occurs first. Measure, to the nearest 0.001 inch, the tread depth of each candidate and course monitoring tire, avoiding treadwear indicators, at six equally spaced points in each groove. For each tire compute the average of the measurements. Do not in-



clude those shoulder grooves which are not provided with treadwear indicators.

(vii) Adjust wheel alignment to the manufacturer's specifications.

(viii) Drive the convoy on the test roadway for 6,400 miles. After each 800 miles:

(A) Following the procedure set out in paragraph (e) (2) (vi) of this section, allow the tires to cool and measure the average tread depth of each tire;

(B) Rotate each vehicle's tires by moving each front tire to the same side of the rear axle and each rear tire to the opposite side of the front axle.

(C) Rotate the vehicles in the convoy by moving the last vehicle to the lead position. Do not rotate driver position within the convoy.

(D) Adjust wheel alignment to the vehicle manufacturer's specifications, if necessary.

(ix) Determine the projected mileage for each candidate tire as follows:

(A) For each course monitoring and candidate tire in the convoy, using the average tread depth measurements obtained in accordance with paragraphs (e) (2) (vi) of this section and the corresponding mileages as data points, apply the method of least squares as described in Appendix C of this section to determine the estimated regression line of  $y$  on  $x$  given by the following formula:

$$y = a + \frac{bx}{1000}$$

where:

$y$  = average tread depth in mils,

$x$  = miles after break-in,

$a$  =  $y$  intercept of regression line (reference tread depth) in mils, calculated using the method of least squares; and

$b$  = the slope of the regression line in mils of tread depth per 1,000 miles, calculated using the method of least squares. This slope will be negative in value. The tire's wear rate is defined as the absolute value of the slope of the regression line.

(B) Average the wear rates of the four course monitoring tires as determined in accordance with paragraph (e) (2) (ix) (A) of this section.

(C) Determine the course severity adjustment factor by dividing the base wear rate

for the course monitoring tire (see note below) by the average wear rate for the four course monitoring tires determined in accordance with paragraph (e) (2) (ix) (B) of this section.

NOTE.—The base wear rates for the course monitoring tires will be furnished to the purchaser at the time of purchase.

(D) Determine the adjusted wear rate for each candidate tire by multiplying its wear rate determined in accordance with paragraph (e) (2) (ix) (A) of this section by the course severity adjustment factor determined in accordance with paragraph (e) (2) (ix) (C) of this section.

(E) Determine the projected mileage for each candidate tire using the following formula:

$$\text{Projected mileage} = \frac{1000(a - 62)}{b'} + 800$$

where:

$a$  =  $y$  intercept of regression line (reference tread depth) for the candidate tire as determined in accordance with paragraph (e) (2) (ix) (A) of this section.

$b'$  = the adjusted wear rate for the candidate tire as determined in accordance with paragraph (e) (2) (ix) (D) of this section.

(F) Compute the percentage of the NHTSA nominal treadwear value for each candidate tire using the following formula:

$$P = \frac{\text{Projected Mileage}}{30,000} \times 100$$

Round off the percentage to the nearest lower 10% increment.

(f) *Traction grading conditions and procedures.*—(1) *Conditions.* (i) Tire traction performance is evaluated on skid pads that are established, and whose severity is monitored, by the NHTSA both for its compliance testing and for that of regulated persons. The test pavements are asphalt and concrete surfaces constructed in accordance with the specifications for pads "C" and "A" in the "Manual for the Construction and Maintenance of Skid Surfaces," National Technical Information Service No. DOT-HS-800-814. The surfaces have locked wheel traction coefficients when evaluated in accordance with paragraphs (f) (2) (i) through (f) (2) (vii) of this section of  $0.50 \pm 0.10$  for the asphalt and  $0.35 \pm 0.10$  for the concrete. The location of the skid pads is described in Appendix B to this section.

(ii) The standard tire is the American Society for Testing and Materials (ASTM) E 501 "Standard Tire for Pavement Skid Resistance Tests."

(iii) The pavement surface is wetted in accordance with paragraph 3.5, "Pavement Wetting System," of ATSM Method E 274-70, "Skid Resistance of Paved Surfaces Using a Full-Scale Tire."

(iv) The test apparatus is a test trailer built in conformity with the specifications in paragraph 3, "Apparatus," of ASTM Method E 274-70, and instrumented in accordance with paragraph 3.3.2 of that Method, except that "wheel load" in paragraph 3.2.2 and tire and rim specifications in paragraph 3.2.3 of that Method are as specified in the procedures in paragraph (f) (2) of this section for standard and candidate tires.

(v) The test apparatus is calibrated in accordance with ASTM Method F 377-74, "Standard Method for Calibration of Braking Force for Testing of Pneumatic Tires" with the trailer's tires inflated to 24 psi and loaded to 1,085 pounds.

(vi) Consecutive tests on the same surface are conducted not less than 30 seconds apart.

(vii) A standard tire is discarded in accordance with ASTM Method E 501.

(2) *Procedure.* (i) Prepare two standard tires as follows:

(A) Condition the tires by running them for 200 miles on a pavement surface.

(B) Mount each tire on a "test rim" as defined in paragraph S3 of Standard No. 109 (§ 571.109 of this chapter) which is of a width within  $-0+0.50$  inches of the width listed for the applicable tire size designation under the words "test rim width" in Table I of the Appendix to Standard No. 109. Then inflate the tire to 24 psi [ , or, in the case of a tire with inflation pressure measured in kilopascals, to 180 kPa. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

(C) Statically balance each tire-rim combination.

(D) Allow each tire to cool to ambient temperature and readjust its inflation pressure to 24 psi [ , or, in the case of a tire with

inflation pressure measured in kilopascals, to 180 kPa. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

(ii) Mount the tires on the test apparatus described in paragraph (f) (1) (iv) of this section and load each tire to 1,085 pounds.

(iii) Tow the trailer on the asphalt test surface specified in paragraph (f) (1) (i) of this section at a speed of 40 mph, lock one trailer wheel, and record the locked-wheel traction coefficient on the tire associated with that wheel between 0.5 and 1.5 seconds after lockup.

(iv) Repeat the test on the concrete surface, locking the same wheel.

(v) Repeat the tests specified in paragraphs (f) (2) (iii) and (f) (2) (iv) of this section for a total of 10 measurements on each test surface.

(vi) Repeat the procedures specified in paragraphs (f) (2) (iii) through (f) (2) (v) of this section, locking the wheel associated with the other tire.

(vii) Average the 20 measurements taken on the asphalt surface to find the standard tire traction coefficient for the asphalt surface. Average the 20 measurements taken on the concrete surface to find the standard tire traction coefficient for the concrete surface. [The standard tire traction coefficient so determined may be used in the computation of adjusted traction coefficients for more than one candidate tire. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

(viii) Prepare two candidate tires of the same construction type, manufacturer, line, and size designation in accordance with paragraph (f) (2) (i) of this section, mount them on the test apparatus, and test one of them according to the procedures of paragraphs (f) (2) (ii) through (v) of this section, except load each tire to 85 percent of the load specified at 24 psi [ , or, in the case of a tire with inflation pressure measured in kilopascals, the load specified at 180 kPa. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)] for the tires' size designation in Appendix A of Standard No. 109 (§ 571.109 of this chapter). [ "Candidate tire measurements may be taken either before or after the standard tire measurements used to compute the standard tire trac-

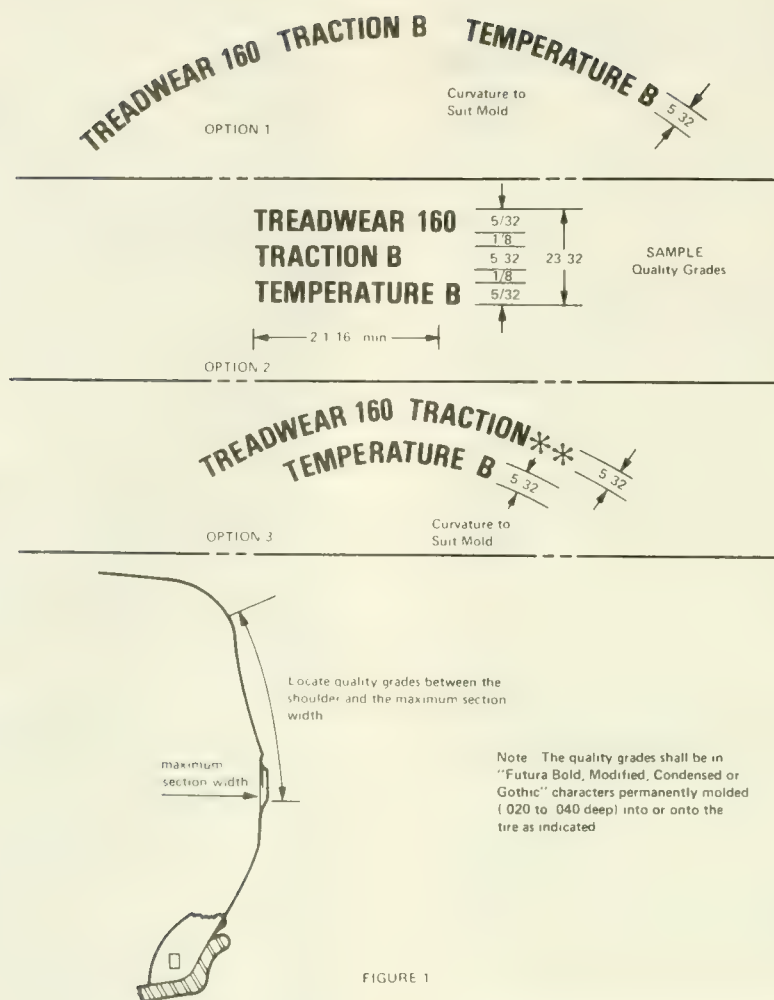


FIGURE 1

tion coefficient. Take all standard tire and candidate tire measurements used in computation of a candidate tire's adjusted traction coefficient within a single three hour period," following the first sentence thereof. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80)] Average the 10 measurements taken on the asphalt surface to find the candidate tire traction coefficient for the asphalt surface. Average the 10 measurements taken on the concrete surface to find the candidate tire traction coefficient for the concrete surface.

(ix) Compute a candidate tire's adjusted traction coefficient for asphalt ( $\mu_a$ ) by the following formula:

$$\mu_a = \text{Measured candidate tire coefficient for asphalt} + 0.50$$

– Measured standard tire coefficient for asphalt

(x) Compute a candidate tire's adjusted traction coefficient for concrete ( $\mu_c$ ) by the following formula:

$$\mu_c = \text{Measured candidate tire coefficient for concrete} + 0.35$$

– Measured standard tire coefficient for concrete

(g) *Temperature resistance grading.* (1) Mount the tire on any test rim as defined in S3 of Standard No. 109 (§ 571.109 of this chapter) and inflate it to [the applicable pressure specified in Table 1 of this section. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

(2) Condition the tire-rim assembly to any temperature up to 95°F for at least 3 hours.

(3) Adjust the pressure again to [the applicable pressure specified in Table 1 of this section. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]



(4) Mount the tire-rim assembly on an axle, and press the tire tread against the surface of a flat-faced steel test wheel that is 67.23 inches in diameter and at least as wide as the section width of the tire.

(5) During the test, including the pressure measurements specified in paragraphs (g) (1) and (g) (3) of this section, maintain the temperature of the ambient air, as measured 12 inches from the edge of the rim flange at any point on the circumference on either side of the tire at any temperature up to 95°F. Locate the temperature sensor so that its readings are not affected by heat radiation, drafts, variations in the temperature of the surrounding air, or guards or other devices.

(6) Press the tire against the test wheel at the load specified in Appendix A of § 571.109 of this chapter (Motor Vehicle Safety Standard No. 109)

for the tire's size designation and [the applicable pressure specified in Table 1 of this section. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

(7) Rotate the test wheel at 250 rpm for 2 hours.

(8) Remove the load, allow the tire to cool to 95°F or for 2 hours, whichever occurs last, and readjust the inflation pressure to [the applicable pressure specified in Table 1 of this section. (45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

(9) Reapply the load and without interruption or readjustment of inflation pressure, rotate the test wheel at 375 rpm for 30 minutes, and then at successively higher rates in 25 rpm increments, each for 30 minutes, until the tire has run at 575 rpm for 30 minutes, or to failure, whichever occurs first.

**[Table 1.—Test Inflation Pressures**

<i>Maximum permissible inflation pressure</i>	<i>32 lb/in<sup>2</sup></i>	<i>36 lb/in<sup>2</sup></i>	<i>40 lb/in<sup>2</sup></i>	<i>240 kPa</i>	<i>280 kPa</i>	<i>300 kPa</i>
Pressure to be used in tests for treadwear and in determination of tire load for temperature resistance testing	24	28	32	180	220	180
Pressure to be used for all aspects of temperature resistance testing other than determination of tire load	30	34	38	220	260	220

(45 F.R. 70273—October 23, 1980. Effective: 10/23/80.)]

**Figure 2—[Part 1] DOT Quality Grades****Treadwear**

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear one and a half (1½) times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, however, and may depart significantly from the norm due to variations in driving habits, service practices, and differences in road characteristics and climate.

**Traction ABC**

The traction grades, from highest to lowest, are A, B, and C, and they represent the tire's ability to stop on wet pavements as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked G may have poor traction performance. **WARNING:** The traction grade assigned to this tire is based on braking (straightahead) traction tests and does not include cornering (turning) traction.

**Temperature ABC**

The temperature grades of A (the highest), B, and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. The grade C corresponds to a level of performance which all passenger car tires must meet under the Federal Motor Vehicle Safety Standard No. 109. Grades B and A represent higher levels of performance on the laboratory test wheel than the minimum required by law. **WARNING:** The temperature grade for this tire is established for a tire that is properly inflated and not overloaded. Excessive speed, under-inflation, or excessive loading either separately or in combination, can cause heat buildup and possible tire failure.

[Part II] All Passenger Car Tires Must Conform to Federal Safety Requirements in Addition to These Grades.

## APPENDIX A

### Treadwear Test Course and Driving Procedures

#### INTRODUCTION

The test course consists of three loops of a total of 400 miles in the geographical vicinity of Goodfellow AFB, San Angelo, Texas.

The first loop runs south 143 miles through the cities of Eldorado, Sonora, and Juno, Texas, to the Camp Hudson Historical Marker, and returns by the same route.

The second loop runs east over Farm and Ranch Roads (FM) and returns to its starting point.

The third loop runs northwest to Water Valley, northeast toward Robert Lee and returns via Texas 208 to the vicinity of Goodfellow AFB.

#### ROUTE

The route is shown in Figure 3. The table identifies key points by number. These numbers are encircled in Figure 3 and in parentheses in the descriptive material that follows.

##### Southern Loop

The course begins at the intersection (1) of Ft. McKavitt Road and Paint Rock Road (FM 388) at the northwest corner of Goodfellow AFB.

Drive east via FM 388 to junction with Loop Road 306 (2). Turn right onto Loop Road 306 and proceed south to junction with US 277 (3). Turn onto US 277 and proceed south through Eldorado and Sonora (4), continuing on US 277 to junction with FM 189 (5). Turn right onto FM 189 and proceed to junction with Texas 163 (6). Turn left onto Texas 163, proceed south to Camp Hudson Historical Marker (7) and onto the paved shoulder. Reverse route to junction of Loop Road 306 and FM 388 (2).

##### Eastern Loop

From junction of Loop Road 306 and FM 388 (2) make right turn onto FM 388 and drive east to junction with FM 2334 (13). Turn right onto FM 2334 and proceed south across FM 765 (14) to junction of FM 2334 and US 87 (15). Make U-turn and return to junction of FM 388 and Loop Road 306 (2) by the same route.

##### Northwestern Loop

From junction of Loop Road 306 and FM 388 (2), make right turn onto Loop Road 306. Proceed onto US 277, to junction with FM 2105(8). Turn left onto FM 2105 and proceed west to junction with US 87 (10). Turn right on US 87 and proceed northwest to the junction with FM 2034 near the town of Water Valley (11). Turn right





onto FM 2034 and proceed north to Texas 208 (12). Turn right onto Texas 208 and proceed south to junction with FM 2105 (9). Turn left onto FM 2105 and proceed east to junction with US 277 (8). Turn right onto US 277 and proceed south onto 306 to junction with 388 (2). Turn right onto 388 and proceed to starting point at junction of Ft. McKavitt Road and FM 388 (1).

**DRIVING INSTRUCTIONS**

The drivers shall run at posted speed limits throughout the course unless an unsafe condition arises. If such condition arises, the speed should be reduced to the maximum safe operating speed.

**BRAKING PROCEDURES AT STOP SIGNS**

There are a number of intersections at which stops are required. At each of these intersections a series of signs is placed in a fixed order as follows:

Sign Legend

- Highway Intersection 1000 (or 2000) Feet  
S T O P A H E A D
- Junction X X X
- Direction Sign (Mereta→)  
S T O P or Y I E L D

**PROCEDURES**

1. Approach each intersection at the posted speed limit.
2. When abreast of the S T O P A H E A D sign, apply the brakes so that the vehicle decelerates smoothly to 20 mph when abreast of the direction sign.
3. Come to a complete stop at the S T O P sign or behind any vehicle already stopped.

**KEY POINTS ALONG TREADWEAR TEST COURSE, APPROX. MILEAGES, AND REMARKS**

	<i>Mileages</i>	<i>Remarks</i>
1 Ft. McKavitt Road & FM 388	0	
2 FM388 & Loop 306 ..	3	STOP
3 Loop 306 & US277 ..	10	
4 Sonora .....	72	
5 US 277 & FM 189 ...	88	
6 FM 189 & Texas 163 .	124	
7 Historical Marker ... (Camp Hudson)	143	U-TURN
4 Sonora .....	214	
3 Loop 306 & US 277 ..	276	
2 FM 388 & Loop 306 .	283	
13 FM 388 & FM 2334 ..	290	STOP
14 FM 2334 & FM 765 ..	292	STOP
15 FM 2334 & US 87 ...	295	U-TURN
14 FM 2334 & FM 765 ..	298	STOP
13 FM 388 & FM 2334 ..	300	STOP/YIELD/ BLINKING RED LIGHT
2 FM 388 & Loop 306 .	307	STOP/YIELD/ BLINKING RED LIGHT
8 US 277 & FM 2105 ..	313	
9 FM 2105 & Texas 208	317	STOP
10 FM 2105 & US 87 ...	320	STOP
11 FM 2034 & US 87 ...	338	
12 FM 2034 & Texas 208	362	YIELD
9 FM 2105 & Texas 208	387	
8 FM 2105 & US 277 ..	391	YIELD/STOP
2 FM 388 & Loop 306 .	397	
1 Ft. McKavitt Road & FM 388	400	

## APPENDIX B

### Traction Skid Pads

Two skid pads have been laid on an unused runway and taxi strip on Goodfellow AFB. Their location is shown in Figure 4.

The asphalt skid pad is 600 ft x 60 ft and is shown in black on the runway in Figure 4. The pad is approached from either end by a 75 ft ramp followed by 100 ft. of level pavement. This arrangement permits the skid trailers to stabilize before reaching the test area. The ap-

proaches are shown on the figure by the hash-marked area.

The concrete pad is 600 ft x 48 ft and is on the taxi strip. The approaches to the concrete pad are of the same design as those for the asphalt pads.

A two lane asphalt road has been built to connect the runway and taxi strip. The road is parallel to the northeast-southwest runway at a distance of 100 ft. The curves have super-elevation to permit safe exit from the runway at operating speeds.

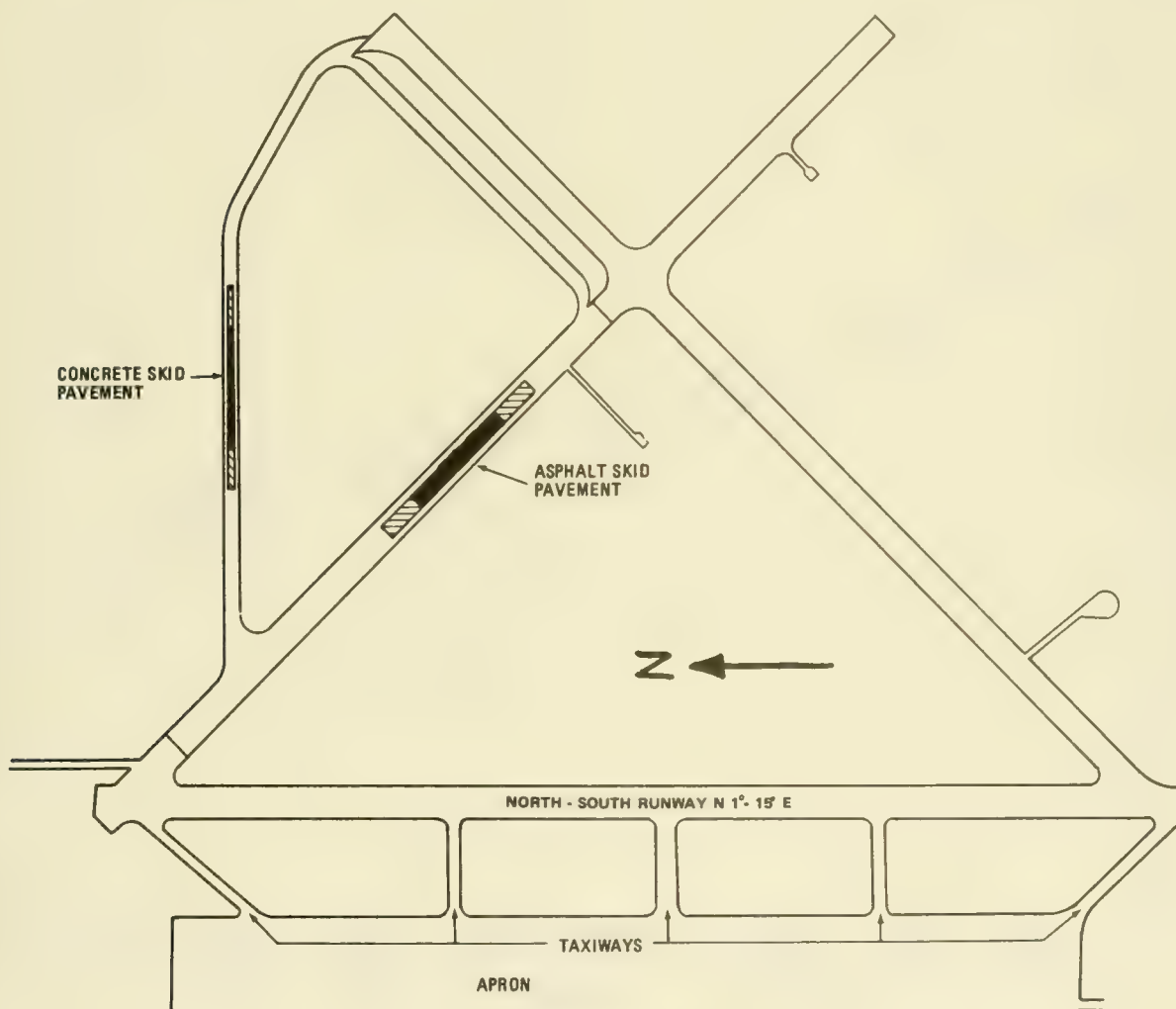


FIGURE 4

## APPENDIX C

### Method Of Least Squares

The method of least squares is a method of calculation by which it is possible to obtain a reliable estimate of a true physical relationship from a set of data which involve random error. The method may be used to establish a regression line that minimizes the sum of the squares of the deviations of the measured data points from the line. The regression line is consequently described as the line of "best fit" to the

data points. It is described in terms of its slope and its "y" intercept.

The graph in Figure 5 depicts a regression line calculated using the least squares method from data collected from a hypothetical treadwear test of 6,400 miles, with tread depth measurements made at every 800 miles.

In this graph,  $(x_j, y_j)$  [ $j=0, 1, \dots, 8$ ] are the individual data points representing the tread depth measurements (the overall average for the tire with 6 measurements in each tire groove) at the beginning of the test (after break-in and at the end of each 800-mile segment of the test.

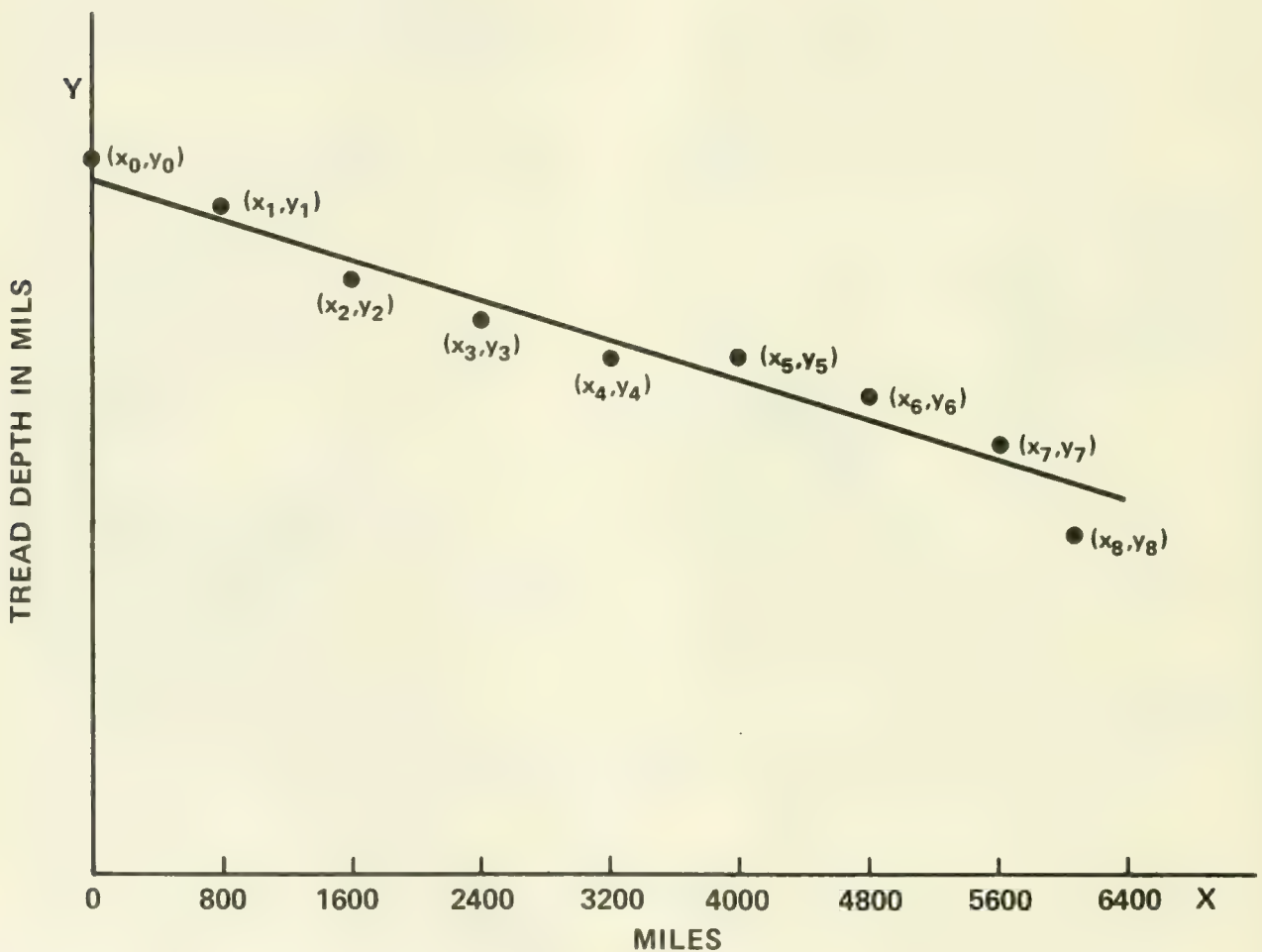


Figure 5



The absolute value of the slope of the regression line is an expression of the mils of tread worn per 1,000 miles, and is calculated by the following formula:

$$b = 1000 \frac{\left( \sum_{j=0}^8 X_j Y_j - \frac{1}{9} \sum_{j=0}^8 X_j \sum_{j=0}^8 Y_j \right)}{\sum_{j=0}^8 X_j^2 - \frac{1}{9} \left( \sum_{j=0}^8 X_j \right)^2}$$

The "y" intercept of the regression line (a) in mils is calculated by the following formula:

$$a = \frac{1}{9} \sum_{j=0}^8 Y_j - \frac{b}{9000} \sum_{j=0}^8 X_j$$

§ 575.105 Deleted

§ 575.106 Deleted

34 F.R. 8112  
May 23, 1969



## PREAMBLE TO PART 576—RECORD RETENTION

(Docket No. 74-31; Notice 1)

This notice establishes an immediate temporary requirement for retention by motor vehicle manufacturers of records concerning malfunctions that may be related to motor vehicle safety.

By a separate notice published today, 39 FR 30048, the NHTSA proposes to establish permanent requirements for the retention of records by manufacturers. The proposed rule would require motor vehicle manufacturers to retain for 5 years all records in their possession relating to failures, malfunctions, or flaws that could be a causative factor in accidents or injuries. These records are needed in agency investigations of possible defects related to motor vehicle safety, or of nonconformity to the safety standards and regulations. A fuller discussion of the proposal is contained in that notice.

The NHTSA finds it important that existing records and those that may be generated or acquired while this rulemaking is under consideration not be disposed of prior to the permanent effectiveness of the rule. In order to maintain the status quo, therefore, this rule is issued to be

effective immediately upon posting for public inspection at the *Federal Register*. For the reasons stated, pursuant to 5 U.S.C. 553(b), notice and public procedure thereon with respect to this interim notice are found to be impracticable and contrary to the public interest. This rule in its present form will be effective only until action is taken upon the proposed permanent rule issued concurrently.

In light of the foregoing, a new Part 576, *Record Retention*, is added to Title 49, Code of Federal Regulations.

*Effective date:* August 15, 1974.

**AUTHORITY:** Sec. 108, 112, 113, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1397, 1401, 1402, 1407; delegation of authority at 49 CFR 1.51.

Issued on August 13, 1974.

James B. Gregory  
Administrator  
**39 F.R. 30045**  
**August 20, 1974**





## PART 576—RECORD RETENTION

(Docket No. 74-13; Notice 1)

Sec.

**576.1 Scope.**

**576.2 Purpose.**

**576.3 Application.**

**576.4 Definitions.**

**576.5 Basic Requirement.**

**576.6 Records.**

**576.7 Retention.**

**576.8 Malfunctions Covered.**

**§ 576.1 Scope.** This part establishes requirements for the retention by motor vehicle manufacturers of complaints, reports, and other records concerning motor vehicle malfunctions that may be related to motor vehicle safety.

**§ 576.2 Purpose.** The purpose of this part is to preserve records that are needed for the proper investigation, and adjudication or other disposition, of possible defects related to motor vehicle safety and instances of nonconformity to the motor vehicle safety standards and associated regulations.

**§ 576.3 Application.** This part applies to all manufacturers of motor vehicles, with respect to all records generated or acquired after August 15, 1969.

**§ 576.4 Definitions.** All terms in this part that are defined in the Act are used as defined therein.

**§ 576.5 Basic Requirements.** Each manufacturer of motor vehicles shall retain as specified in § 576.7 all records described in § 576.6 for a period of 5 years from the date on which they were generated or acquired by the manufacturer.

**§ 576.6 Records.** Records to be retained by manufacturers under this part include all documentary materials, films, tapes, and other information-storing media that contain information concerning malfunctions that may be related to motor vehicle safety. Such records include, but are not limited to, communications from vehicle users and memoranda of user complaints; reports and other documents related to work performed under, or claims made under, warranties; service reports or similar documents from dealers or manufacturer's field personnel; and any lists, compilations, analyses, or discussions of such malfunctions contained in internal or external correspondence of the manufacturer.

**§ 576.7 Retention.** Duplicate copies need not be retained. Information may be reproduced or transferred from one storage medium to another (e.g., from paper files to microfilm) as long as no information is lost in the reproduction or transfer, and when so reproduced or transferred the original form may be treated as a duplicate.

**§ 576.8 Malfunctions covered.** For purposes of this part, "malfunctions that may be related to motor vehicle safety" shall include, with respect to a motor vehicle or item of motor vehicle equipment, any failure or malfunction beyond normal deterioration in use, or any failure of performance, or any flaw or unintended deviation from design specifications, that could in any reasonably foreseeable manner be a causative factor in, or aggravate, an accident or an injury to a person.

39 F.R. 30045  
August 20, 1974





**PREAMBLE TO PART 577—DEFECT NOTIFICATION**

(Docket No. 72-7; Notice 2)

This notice establishes a new regulation covering notifications of motor vehicle safety defects and nonconformity to safety standards. The notice proposing these regulations was published May 17, 1972 (37 F.R. 9783).

The regulation is intended to improve the response of owners in vehicle notification campaigns. Data which the NHTSA has been receiving on the completion rates of notification campaigns show a wide range of completion rates, with campaigns involving newer vehicles, and more serious safety problems, having higher completion rates than others. In many campaigns, however, the rate is alarmingly low.

An examination of the notifications sent by manufacturers reveals wide disparity in emphasis. Although precise evaluation of the impact of notification letters is difficult, due to its being largely subjective, the NHTSA is of the opinion that many notifications have tended to deemphasize the safety problems involved. Some of these notification letters are questionably within the requirements of the National Traffic and Motor Vehicle Safety Act, and litigation on a case by case basis to improve them is practicable. These regulations are intended to ensure that all notification letters contain sufficient information, as determined by NHTSA, to properly notify purchasers.

The regulation applies to manufacturers of incomplete and complete motor vehicles, and motor vehicle equipment. In the case of vehicles manufactured in two or more stages, compliance by any one of the manufacturers of the vehicle is considered compliance by all. This provision is based on similar language in the Defect Reports regulation (Part 573 of this chapter), and is included in response to comments received.

The regulation requires the notification to contain substantially the information specified in

the proposal. It requires each notification to begin with a statement that it is sent pursuant to the requirements of the National Traffic and Motor Vehicle Safety Act. The NHTSA did not concur with comments to the effect that the inclusion of this statement would not promote the purpose of the regulation. The regulation requires the notification to state that the manufacturer, or the National Highway Traffic Safety Administrator, as the case may be, has determined that a defect relating to motor vehicle safety (or a noncompliance with a motor vehicle safety standard) exists in the vehicle type, or item of motor vehicle equipment, with which the notification is concerned. When the manufacturer (or the Administrator) has, as part of his determination, also found that the defect may not exist in each such vehicle or equipment item, he may include a statement to that effect. The NHTSA has decided to allow such statements based on comments that many defects in fact do not exist in each vehicle or equipment item of the group whose owners are notified.

The manufacturer must also describe the defect, evaluate the risk it poses to traffic safety, and specify measures which the recipient should take to have it remedied. In each case, the regulation requires information which the NHTSA has determined will meet these objectives. In describing the defect, the manufacturer must indicate the vehicle system or particular items of equipment affected, describe the malfunction that may occur, including operating conditions that may cause it to occur, and precautions the purchaser should take to reduce the likelihood of its occurrence. In providing that the vehicle system affected be mentioned, the regulation reflects comments to the effect that listing each particular part involved would be too technical to be useful to most consumers.

In evaluating the risk to traffic safety, the manufacturer must indicate if vehicle crash is the potential result, and whatever warning may occur. Where vehicle crash is not the potential result, the manufacturer must indicate the general type of injury which the defect can cause. Although many comments protested that it was impossible to predict a specific type of injury, the NHTSA believes that manufacturers can easily foresee the general type of injury, such as asphyxiation, that can result from those defects which are not expected to result in crashes.

In stating measures to be taken to repair the defect, the requirements differ in the case where the manufacturer's dealers repair the vehicle free of charge to the purchaser, where the manufacturer merely offers to pay for the repair, and where he refuses to pay for the repair. The purpose of this distinction is to provide information sufficient to have adequate repairs made in each case.

Where the manufacturer's dealers repair the vehicle free of charge, the notification must include a general description of the work involved, the manufacturer's estimate of when his dealers will be supplied with parts and instructions, and his estimate of the time reasonably necessary to perform the labor involved in correcting the defect. The agency's position is that consumers are entitled to know approximately when their cars will be repaired and how much labor is needed in order for the repair to be made. The NHTSA realizes that dealers frequently retain vehicles longer than the actual work involved, due to difficulties in scheduling repairs. However, manufacturers are free to impart this information to consumers under the regulation. Some comments objected to requiring manufacturers to provide information on when replacement parts will be available, on the basis that manufacturers cannot know, at the time a notification is issued, precisely when parts deliveries will be made to dealers. To include this information, it is argued, would therefore delay the issuance of the notification. The NHTSA has modified the proposed language to allow manufacturers to "estimate" when corrective parts will be available. The estimate would be based on the manufacturer's knowledge at the time the notification is sent, thereby eliminating any reasons for delay.

When manufacturers do not provide for repairs to be made by dealers, the notification is required to contain, in addition, full lists of parts and complete instructions on making the repairs. The regulation also requires the manufacturer to recommend, generally, where the vehicle should be repaired, and manufacturers are free to make general and specific recommendations. This requirement reflects the intent of the proposal that manufacturers who believe particular repairs may require special expertise should indicate that fact to purchasers.

When the manufacturer does not offer to pay for repairs, he must, in addition, include full cost information on necessary parts. The notice would have required the retail cost of all parts, and information on labor charges of the manufacturer's dealers in the general area of the purchaser. In response to comments, the cost information is limited to the suggested retail price of parts. Manufacturers have indicated they do not set actual prices of parts, but do have suggested list prices. With respect to labor charges, manufacturers have indicated that labor charges vary, and that requiring them to ascertain exact charges would delay issuance of notifications. The NHTSA believes these comments to be well-founded, and has dropped the proposed requirements regarding labor charges. Consumers will still have information on costs of parts, and time necessary for repairs to be performed, from which they can obtain a fair idea of the cost of a repair.

The regulations prohibit the notification from stating or implying that the problem is not a defect, or that it does not relate to motor vehicle safety. Moreover, in those cases where the notification is sent pursuant to the direction of the Administrator, it cannot state or imply that the manufacturer disagrees with the Administrator's finding. Many comments opposed these requirements on the basis that they unconstitutionally limited manufacturers' freedom of speech. The NHTSA emphatically rejects this contention. Notification letters are not intended to serve as forums where manufacturers can argue that problems are not safety-related or dispute the Administration's findings. Their purpose is to unambiguously and adequately induce owners to remedy a potentially hazardous situation. The



NHTSA is of the opinion that there is ample precedent that allows the Federal government to require manufacturers to warn purchasers in a particular manner that certain products they manufacture may be hazardous. If a manufacturer does not believe that his condition is a safety-related defect, he is not required by law to notify owners at all. It is only when he determines that a defect exists that he must notify in accordance with the regulations. Similarly, when the Administrator has made the finding that a certain product is defective, the manufacturer can administratively and judicially challenge this determination as provided in the National Traffic and Motor Vehicle Safety Act before sending a notification.

The NHTSA received other objections to the proposed requirements. Numerous tire manufacturers argued that parts of the regulation dealing with repairs of defects are inappropriate when applied to them, since repairs generally meant replacement. Certain manufacturers of lighting equipment argued that notification requirements should not apply to them at all. The NHTSA disagrees with both of these contentions. In the case of tire manufacturers, the NHTSA believes that the requirements can be followed. If the repair of a defective tire entails its replacement, this can certainly be stated within the regulatory scheme. Similarly, lighting equipment manufacturers are responsible for defects to the same extent as manufacturers of other equipment. The NHTSA rejects completely the argument that no lighting failures can be considered safety-related because of the millions of lights that burn out every year without resulting in accidents. The question in each case is not whether a failure may occur, but whether a defect exists, and whether the defect may cause a hazardous situation to arise.

The notice of proposed rulemaking would have prohibited manufacturers from making statements contemporaneous with the notification that disagreed with its conclusions. This proposal has not been adopted. After careful consideration, the NHTSA has determined that its inclusion is probably unnecessary. The agency's position is that if notification letters clearly and unambiguously describe and evaluate defects in accordance with this regulation, other statements

by manufacturers will not normally affect reactions of consumers.

Certain comments requested that manufacturers be allowed to state in the notification that it does not constitute an admission of liability or wrongdoing. The regulation does not preclude the making of such statements, as the agency has concluded that their inclusion will not significantly deter owners from having repairs made.

One comment suggested that the notification be required to contain a postage-free card by which consumers could notify manufacturers when vehicles had been sold or otherwise disposed of. While the NHTSA believes this practice would be advantageous in improving notification campaigns, it has concluded that such a requirement would be outside the scope of the regulation, which is limited to notifications to first purchasers and warranty holders.

Certain comments objected to the regulations on the ground that they prescribed a rigid format in an area where each case must be treated separately, and thus where flexibility was required. The NHTSA has modified to some extent the proposed restrictions on format. Manufacturers are free, within the limits established, to compose notifications to fit each case. As issued, these regulations do not require rigid, inflexible letters (only the first two sentences must contain specific statements in a set order), but require that manufacturers include certain important items of information. It is hoped that manufacturers in meeting these requirements will provide required information in easily understandable form.

In light of the above, a new Part 577, "Defect Notification" is added to Chapter V of Title 49, Code of Federal Regulations, to read as set forth as below.

*Effective date:* March 26, 1973. Because these requirements are not technical in nature, and do not require lead times for compliance, good cause exists, and is hereby found, for an effective date less than 180 days from the day of issuance.

Issued on January 17, 1973.

Douglas Toms  
Administrator

**38 F.R. 2215**  
**January 23, 1973**





**PREAMBLE TO AMENDMENT TO PART 577—DEFECT NOTIFICATION****(Docket No. 72-7; Notice 3)**

This notice responds to petitions for reconsideration of the Defect Notification regulations, published January 23, 1973 (38 FR 2215). Petitions were received from the Firestone Tire and Rubber Company, Chrysler Corporation, the Motor and Equipment Manufacturers' Association, and the Recreational Vehicle Institute. A petition was also received from the Wagner Electric Company. Although not received within 30 days of the regulation's publication (49 CFR 553.35), it has been considered in the preparation of this notice. Insofar as this notice does not grant the requests of the petitioners, they are hereby denied.

The Firestone Tire and Rubber Company has petitioned for reconsideration of section 577.6, "Disclaimers", which prohibits manufacturers from starting or implying that the notification does not involve a safety related defect. Firestone requested that the provision, for Federal Constitutional reasons, be dropped from the rule. This request is denied. The NHTSA does not believe, for the reasons set forth in the notice of January 23, 1973 (38 FR at 2216), that the provision is violative of the Constitution.

Chrysler Corporation has requested that the phrase, "his dealers" be modified in section 577.4(e)(1)(ii), which requires the manufacturer to estimate the date by which his dealers will be supplied with corrective parts and instructions. It argues that the phrase "his dealers" could be interpreted to mean all dealers, regardless of whether all of the manufacturer's dealers are involved in the campaign. This request is denied. Neither section 113 of the Safety Act nor the regulation require a notification campaign to extend to all of the manufacturer's dealers, whether or not they have any involvement in a particular campaign. The NHTSA does not believe that the phrase "his dealers", when read in context, means all of the manufacturer's dealers.

Chrysler also asks that special requirements be specified for the notification of "noncompliance non-operational defects", citing as an example the improper placement of the VIN plate under Motor Vehicle Safety Standard No. 115. Chrysler states that existing provisions of the regulation dealing with malfunctions (specifically 577.4(c)(2), (c)(3), (c)(4)), and evaluating the risk to traffic safety (sections 577.4(d), (d)(1), (d)(1)(i), (d)(1)(ii), (d)(2)) are not pertinent to these defects. This request is denied. The NHTSA does not believe that separate requirements for notification of the type of defect described by Chrysler are either necessary or desirable. If a particular defect does not involve a malfunction, to be in compliance with the regulation a manufacturer should, in response to the appropriate provisions of the regulation, indicate that to be the case. The NHTSA believes this approach will notify purchasers of the defect as effectively as separate, more specific requirements. The NHTSA does not agree that the relationship to safety of these types of defects should not be evaluated in notification letters, similarly to other defects.

The Motor and Equipment Manufacturers Association (MEMA) objects to the requirements of sections 577.4(e)(2)(vi) and 577.4(e)(3)(vi) that the manufacturer recommend whom the purchaser should have perform necessary repair work, and requests that these provisions be deleted. MEMA argues that the requirement is anti-competitive in that it sanctions the steering of consumers to vehicle dealerships for repairs, to the detriment of the independent repair industry, even when the manufacturer does not pay for the repair. MEMA argues that original equipment replacement parts are frequently more expensive than competitively produced parts, resulting in added costs to owners. It argues also that limiting repairs to dealers precludes the use

of the full domestic repair industry, which should be utilized fully given the magnitude of recent notification campaigns.

While the NHTSA appreciates the concern of this association in not being precluded from a large market, the NHTSA believes the requirement as issued to be consistent with the National Traffic and Motor Vehicle Safety Act and the need for motor vehicle safety. The NHTSA has, in issuing the requirement, indicated that manufacturers should indicate to purchasers when special expertise may be necessary to correct defects. The repairs in issue do not involve normal maintenance, but constitute defects whose proper repair is essential to the safety of the nation's highways. Frequently these repairs involve a higher degree of expertise and familiarity with a particular vehicle than that required to perform normal maintenance. If such expertise will more likely be found at dealerships, in the view of the vehicle manufacturer, the NHTSA believes that opinion should be imparted to purchasers.

Moreover, even if the NHTSA deleted the requirement the manufacturer could if he desired, consistently with the regulation, recommend a repair facility. The NHTSA would not prohibit the making of such a recommendation, for it is responsive to the statutory requirement that the notification contain a statement of the measures to be taken to repair the defect (15 U.S.C. 1402(c)). Moreover, the argument that the regulation stifles competition does not appear to have merit. In the event the manufacturer does not bear the cost of repair, the regulation (§ 577.4(e)(3)(i)) requires the manufacturer to provide the purchaser with the suggested list price of repair parts. As a consequence, purchasers will be provided with information with which they can "shop", with full knowledge, for the least expensive repair facilities. The petition is accordingly denied.

The Recreational Vehicle Institute (RVI) has petitioned that the requirements of both section 577.4(a), requiring an opening statement that the notification is sent pursuant to the Act, and section 577.6, prohibiting disclaimers, be deleted. RVI argues such requirements may result in delay by manufacturers in determining that defects

exist, forcing the use of administrative and legal procedures before purchasers are notified. The agency cannot accept the position that the notification should be diluted because of possible evasion by manufacturers. The NHTSA believes that the need that notification letters fully inform purchasers outweighs the possible problems caused by manufacturers delaying their notifications to purchasers until forced to notify them. The request is denied.

RVI points out that section 577.4 seems to assume that defects will be evidenced by some form of mechanical failure. It asks, therefore, whether a safety-related defect can exist where proper corrective action to avoid an occurrence or possible occurrence is appropriate maintenance or operational use. RVI also requests, if NHTSA adheres to its present position regarding these issues, that it undertake rulemaking to define "safety related defect". For the following reasons, these requests are denied. There is no intent in the regulation to limit the concept of safety related defects to those involving mechanical failures. As stated above, in reply to the petition from Chrysler, non-mechanical defects can be the basis of defect notification, and purchasers can be fully notified of them under the present regulatory scheme. Moreover, the NHTSA believes any attempt to precisely define safety related defect would be ill-advised. Whether a defect exists depends solely on the facts of each particular situation. The fact that such determinations may encompass a wide variety of factual situations, and may consequently be difficult to make, does not mean that it is necessary, desirable, or even possible to replace the decision with a simple formula. The NHTSA believes, on the contrary, that the relatively broad definition of defect contained in the Safety Act is best suited to the wide variety of defective conditions that may arise.

RVI has also pointed out that references to a manufacturer's dealers in section 577.4(e), specifying measures to be taken to repair the defect, overlook the fact that manufacturers' dealers may not always provide service facilities, or that manufacturers may use service facilities other than dealers. The NHTSA agrees with RVI, and has therefore modified the provisions of that



section to include "other service facilities of the manufacturer", as well as his dealers.

RVI requested that the regulation be amended to permit compliance by either a component manufacturer or a vehicle manufacturer, when the defect involves a specific component. RVI also requested that compliance be permitted by either the vehicle alterer or the complete vehicle manufacturer in cases involving altered vehicles. The regulations do not prohibit the sending of notification letters by persons other than the vehicle manufacturer. Accordingly, no modification of the regulation is called for. However, manufacturers who do utilize the services of others in meeting requirements still bear the ultimate responsibility for compliance with the regulation under the National Traffic and Motor Vehicle Safety Act.

The Wagner Electric Company has requested that the provisions of the regulation regarding manufacturers of motor vehicle equipment (excluding tires) be reconsidered in light of the fact that, under present marketing procedures, it is difficult or impossible for such manufacturers to notify jobbers, installers, dealers, or consumers. The notification required by the regulation is directed at the notification sent to retail purchasers and not that sent to distributors or dealers of the manufacturer. The notification of the latter is subject only to the statutory provision

of section 113 of the Safety Act (15 U.S.C. 1402). Moreover, manufacturers of equipment (other than tires) who do not have the names of first purchasers are not required to notify them either under the National Traffic and Motor Vehicle Safety Act or the regulation. There is consequently no need for modification of the regulation for the reasons presented by Wagner, and its request is accordingly denied.

In light of the above, Part 577 of Title 49, Code of Federal Regulations, "Defect Notification", is amended . . . .

Effective date: April 17, 1973. These amendments impose no additional burdens on any person, and serve only to clarify the application of existing requirements to specific situations. Accordingly, notice and public procedure thereon are unnecessary, and good cause exists for an effective date less than thirty days from the day of publication.

(Sec. 108, 112, 113, 119, Pub. L. 89-563, 80 Stat. 718 as amended, sec. 2, 4, Pub. L. 91-265, 84 Stat. 262 (15 U.S.C. 1397, 1401, 1402, 1408); delegation of authority at 49 CFR 1.51)

Issued on April 10, 1973.

James E. Wilson  
Acting Administrator

**38 F.R. 9509**  
**April 17, 1973**



## PREAMBLE TO AMENDMENT TO PART 577—DEFECT NOTIFICATION

(Docket No. 74-42; Notice. 2)

This notice amends 49 CFR Part 577, *Defect Notification*, to require that bilingual notification be sent to owners in certain cases, and to clarify the wording manufacturers are required to use to indicate their determination that a safety-related defect exists.

A notice of proposed rulemaking on this subject was published on November 25, 1974, (39 F.R. 41182) and an opportunity afforded for comment. The Center for Auto Safety had questioned the efficacy of defect notification campaigns in Puerto Rico conducted in the English language since the primary language of that Commonwealth is Spanish. A National Highway Traffic Safety Administration (NHTSA) survey in Puerto Rico confirmed that there was a need for bilingual defect notification. It was proposed that whenever the address of the purchaser is in either the Commonwealth of Puerto Rico or the Canal Zone the notification be sent in both the English and Spanish languages.

The notice also proposed clarifying § 577.4(e) (1) so that the second paragraph of a notification letter could no longer be written to reflect a manufacturer's belief that the cause of a defect is an item other than that which he manufactured.

Only Chrysler Corporation and Firestone Tire and Rubber Company commented on bilingual notification. Both stated that it was not necessary for the Canal Zone. Firestone also felt that the requirement to translate the notification would delay its mailing, and voiced the belief that NHTSA must express the exact wording in Spanish for § 577.4(a) and (b). Chrysler commented that it had been providing bilingual notification to owners of automobiles purchased in Puerto Rico but that extensive and burdensome data-processing reprogramming would be required to identify owners of vehicles originally

purchased on the mainland and later taken to Puerto Rico.

The NHTSA believes that the language problem is a significant factor in the below-average response to notification campaigns in Puerto Rico, and that owner response rate to campaigns in the Canal Zone will improve if notifications are provided in Spanish as well as English. Information from the Census Bureau indicates that more than 50% of the residents of each area speak Spanish as their primary language. Translation may delay mailing to these areas a few days, but this is deemed inconsequential compared with the benefits to be derived by an improved response to campaigns. This agency does not consider that it need specify the exact wording in Spanish of § 577.4(a) and (b). If it appears that manufacturers are providing ambiguous statements it will consider the matter further. Finally, since section 153(a) (1) of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1413(a) (1), requires notification to be sent to the person who is registered under State law as the owner of the vehicle to be campaigned, Chrysler's comments on reprogramming of data do not appear to have merit.

This notice also amends § 577.4(b) (1), which presently requires the second sentence of the notification to state that the manufacturer has determined that a defect which relates to motor vehicle safety exists in its motor vehicles or motor vehicle equipment. Certain notification letters have characterized the defect as existing in a vehicle or item of equipment not manufactured by the manufacturer making the determination. The intent of the section is that a manufacturer of motor vehicles would state its determination that the defect exists in the motor vehicle it manufactures, while a manufacturer of motor vehicle equipment would state its de-



termination that the defect exists in the motor vehicle equipment it manufactures. If the manufacturer believes the cause of the defect to be an item other than that which he manufactured, that information can be imparted in the other parts of the notification, but not in the second paragraph where the content is specifically prescribed.

Kelsey-Hayes Company and Skyline Corporation commented on the proposal to clarify § 577.4(b)(1). Both objected to it, feeling that the present regulation is adequate and that the mandatory statement may be prejudicial. However, in the opinion of this agency, manufacturers with limited experience in composing notification letters have in many cases misinterpreted

§ 577.4(b)(1). Clarification of the sentence should eliminate mistakes.

In consideration of the foregoing, Part 577 of Title 49, Code of Federal Regulations, *Defect Notification*, is amended. . . .

*Effective date:* September 14, 1975.

(Sec. 108, 112, 113, 119, Pub. L. 89-563, 80 Stat. 718; sec. 2, 4, Pub. L. 91-265, 84 Stat. 262 (15 U.S.C. 1397, 1401, 1402, 1407); delegation of authority at 49 CFR 1.51.)

Issued on June 10, 1975.

James B. Gregory  
Administrator

**40 F.R. 25463**  
**June 16, 1975**

## PREAMBLE TO AMENDMENT TO PART 577—DEFECT NOTIFICATION

(Docket No. 75-10; Notice 2)

This notice amends 49 CFR Part 577, "Defect Notification," to conform to §§ 151 through 160 of the National Traffic and Motor Vehicle Safety Act (the Act) (Pub. L. 93-492, 88 Stat. 1470, October 27, 1974; 15 U.S.C. 1411-1420).

The amendments of Part 577 were published as a notice of proposed rulemaking in the *Federal Register* on May 6, 1975 (40 FR 19651). Approximately 30 comments were received from vehicle and equipment manufacturers, equipment distributors, trade associations representing these groups, and the Center for Auto Safety. The National Motor Vehicle Safety Advisory Council did not take a position on this proposal. Interested persons are advised that NHTSA Dockets 75-30 (Defect and Noncompliance Responsibility), 75-31 (Petitions for Hearing on Notification and Remedy of Defects or Failure to Comply), and 74-7 (Defect and Noncompliance Reporting) are relevant to the subject matter of this rulemaking.

The agency is amending its earlier notification procedures to reflect the major expansion of manufacturer responsibilities under the Motor Vehicle and Schoolbus Safety Amendments of 1974 to notify vehicle and equipment owners or purchasers of noncompliances with safety standards and of defects that relate to motor vehicle safety (hereinafter referred to as defects), chief of which is that remedy shall be without charge in most cases.

The new regulation specifies the content, timing, and form of notification that complies with the requirements set forth in § 153 of the Act. Distinctions among notifications that arise under different circumstances are set forth in detail. Provisions concerning disclaimers in the notification and conformity to the statutory requirements are carried over from the former Part 577.

Comments on the proposal were generally in agreement with the revision of the regulation, in recognition that the revision reflects responsibilities already a matter of law. Several questions were raised with regard to the authority for or wisdom of specific provisions of the proposed regulation, and these are discussed below.

Motor vehicle manufacturers and the Motor Vehicle Manufacturers Association (MVMA) expressed strong support for modification of the statutory definitions of "original equipment" and "replacement equipment" that allocate responsibility for notification and remedy between vehicle and equipment manufacturers. The agency has issued a separate proposal to redistribute responsibility (40 FR 56930, December 5, 1975) which addresses the issues raised. Resolution of that proposal will be responsive to the issues raised by the MVMA and vehicle manufacturers. To simplify any future action in this area, the two terms are no longer set forth in Part 577.

In the definitions section of the regulation, the phrase "in good faith" has been added to the definition of "first purchaser" to conform to its meaning under § 108(b)(1) of the Act.

The Recreational Vehicle Industry Association (RVIA) requested that vehicle alterers be permitted to meet (assume) the obligations of manufacturers for notification and remedy on a voluntary basis. Without notice and opportunity for comment on this idea, the agency does not consider it wise to modify the regulation as suggested by the RVIA.

### NOTIFICATION PURSUANT TO A MANUFACTURER'S DETERMINATION

Section 151 of the Act provides that a manufacturer who determines in good faith that a defect or noncompliance exists in its products

"shall furnish notification to the Secretary and to owners, purchasers, and dealers in accordance with section 153, and he shall remedy the defect or failure to comply in accordance with section 154."

Section 577.5 of Part 577 provides for manufacturer-initiated notifications in accordance with § 151. The section specifies, among other things, that a statement appear in the notification that the manufacturer has determined that a defect or noncompliance exists in identified vehicles or equipment. An additional statement may be made to indicate that the problem may not exist in each such vehicle or item of equipment. The MVMA and American Motors Corporation (AMC) believed that a better approach would be to state that the defect or noncompliance exists in some, but not all, vehicles or items of equipment (if such is the case), and that an owner should bring his vehicle in for inspection in any case. The agency does not believe that either the MVMA or AMC has an expertise in this area and declines to adopt the suggested modification.

Paragraph (e) of § 577.5 requires a clear description of the defect or noncompliance, including, among other things,

(e) \*\*\*

(2) A description of any malfunction that may occur. The description of a noncompliance with an applicable standard shall include the difference between the performance of the noncomplying vehicle or item of replacement equipment and the performance specified by the standard;

The MVMA viewed the phrase "any malfunction" as overbroad and ambiguous, in that a manufacturer would be held to correctly anticipate a malfunction, whether or not related to safety or the noncompliance. The agency agrees that such a description would go beyond the purpose of the notification and therefore has narrowed somewhat the language proposed.

Vehicle manufacturers and the MVMA argued that the second sentence of paragraph (e)(2) should be deleted because an exact description of the difference in performance due to noncompliance would be too technical for comprehension by most owners, require extensive and expensive

testing in some cases that would delay notification, and be the basis for a technical violation of the regulation. The agency believes that the description is valuable to vehicle or equipment owners in understanding the noncompliance, but agrees that a detailed description could delay notification unnecessarily. Accordingly, the phrase "in general terms" is added to modify the required description.

The Center for Auto Safety (the Center) believed that the statement required by (e) to minimize the chances of an accident before remedy failed to mention prior warnings that the vehicle's operating characteristics might differ. While prior warning is adequately covered by the "evaluation of risk" statement made regarding the possibility of vehicle crash (paragraph (f)(1)(ii)), the agency has added a comparable requirement to paragraph (f)(2) (that covers "non-crash" type defects and non-compliances).

The Specialty Equipment Manufacturers Association objected that any evaluation of the risk to motor vehicle safety would be speculative and therefore was unjustified. This requirement, however, is based on the specific requirement of § 153(a) of the Act, and cannot be eliminated.

The Center believed that the evaluation of risk to motor vehicle safety is a discretionary statement that need not be made by a manufacturer. This is not the case. Section 577.5 is a requirement that the information (b) through (g) be listed and, under paragraph (f), the evaluation must either describe the crash hazard or be a description of the "general type of injury to occupants, or [others], that can result."

Paragraph (g) of § 577.5, dealing with measures to be taken by the owner, proved to be the greatest source of comments on the proposal. The paragraph is divided into subparagraphs dealing with notification of remedy without charge and notification of remedy for which the manufacturer will charge. This distinction is based on § 154(a)(4) of the Act which limits the "remedy without charge" to vehicles or equipment first purchased no more than 8 years (3 years in the case of tires) before notification in accordance with §§ 151 or 152.

Paragraph (g)(1) specifies requirements both for notification when the remedy must be under-



taken and also notification when the manufacturer voluntarily decides to remedy without charge. The MVMA and General Motors (GM) felt that manufacturers undertaking voluntary remedy should not be subjected to the same notification requirements as those manufacturers required to remedy. The agency distinguishes between the separate duties of notification and remedy, however, and notes that the notification requirements of § 153 of the Act contain no exceptions for older vehicles and equipment. The MVMA's abbreviated list of requirements for a voluntary remedy do not fulfill the requirements of § 153. For example, § 153(a)(2) requires that the notification contain an evaluation of the risk to motor vehicle safety.

It is the agency's philosophy that a manufacturer undertaking a remedy should provide the same information to the owner whether or not the remedy is undertaken voluntarily. In this way, an owner will be apprised of the information necessary to make informed decision. Also, events beyond the manufacturer's control will not be able to negate the remedy without agency or manufacturer's knowledge. For these reasons, the agency does not modify the requirements as suggested.

Aside from the general suitability of paragraph (g)(1)'s requirements for a voluntary remedy, manufacturers raised more specific questions about the separate provisions.

International Harvester Company (IH) asserted with regard to paragraph (g)(1)(i) that no basis existed for the exception of replacement equipment from the right to refund as a means of remedy. In the agency's view, § 154(2)(B) of the Act clearly limits the remedy for items of replacement equipment to either repair or replacement.

IH objected to the requirements that the earliest date for repair set under paragraph (g)(1)(ii) be premised on anticipated receipt by dealers of necessary parts for repair. The company pointed out that some repair parts would not typically be forwarded to a dealer for repair until a specific request has arisen. The agency would like to clarify that the "earliest date" can be established as a certain number of days following inspection of the defective or noncomply-

ing vehicle. Thus a manufacturer need only calculate the time that it would take to get the parts to the dealer following an inspection and then state that the earliest date for repair will follow the date of inspection by that amount.

AMC argued that the requirement for a general description of the work and amount of time involved in a repair without charge by the manufacturer's dealer exceeded the authority of the Act and is unnecessary when the manufacturer undertakes repair. The same argument was made with regard to paragraphs (g)(1)(v) and (vi). The agency disagrees, and notes that the specific authority listed in § 153(a) is "in addition to such other matters as the Secretary may prescribe by regulation." As for the need for a general description, it is concluded that the owner would value knowledge of the time involved and the nature of the repair that is involved, to correctly weigh the gravity of the problem. Correspondingly, the offer of replacement or refund is more helpful to the owner if it includes the detail that has been specified.

In paragraph (g)(1)(iv), the MVMA asked for parallelism with the construction of paragraph (g)(1)(iii). It is accomplished by the addition of "or its dealers" following the word "manufacturer." IH suggested the addition of "authorized service centers" to the list, but this is unnecessary in view of the NHTSA's interpretation of "dealer" to include an authorized service center.

The Center, Mack Trucks, and Crane Carrier Corporation (CCC) commented on paragraph (g)(1)(iv)'s requirement that the method or basis for a manufacturer's assessment of depreciation be specified. The two manufacturers suggested use of a retailer's price guide as the basis. The Center suggested that a method for determination of depreciation be devised by a panel of industry, government, and consumer representatives. The legislative history indicates that retailer price guides should not be the sole criterion, and thus the Mack and CCC recommendations are not adopted. Until there is some indication that the manufacturers' chosen methods of assessment are unreasonable, the agency does not consider it necessary to exercise its authority in this area, and the Center's suggestion is also not adopted.

The greatest objections were raised regarding the statement advising an owner how to inform the NHTSA if he believes that the notification or remedy is inadequate, or that the remedy was untimely or not made in accordance with the notification. PACCAR, AMC, Chrysler, GM, IH, the RVIA, and the MVMA considered the statement to be, in some respects, beyond the agency's statutory authority and not contemplated by Congress. As earlier noted, § 153 is prefaced by a general grant of authority to the agency to specify the contents of the notification.

The agency has considered the objections, in any case, particularly in view of the decision to require the same notification in the case of voluntary and mandatory remedy notices. It is concluded that modification of the statements to reflect the exact terms of § 154(a)(6) is appropriate.

Manufacturers objected to the language of paragraph (g)(1)(vii)(C) that invites owner complaints if a remedy is not effected within a reasonable period. The agency considers timeliness to be an aspect of whether a manufacturer has failed or is unable to provide a remedy as specified in § 153(a)(6) of the Act. The agency does agree that remedy by replacement or refund should not be limited to the first 60 days, since it might follow a failure to repair within that 60-day period. In conforming to § 154(b)(1), the agency substitutes "tender" for "first attempt." Also reference to extension by the Administrator of the 60-day repair period has been added to paragraph (g)(1)(vii)(C)(1).

GM suggested that an additional statement be made to owners, advising them of recourse available with the manufacturer if the dealer's response is unsatisfactory. The agency considers this desirable but, without the benefit of notice and opportunity for comment, declines to make this addition. Paragraph (g)(1), of course, only sets forth what the manufacturer "shall include" in its notification, and it may make such additional statements as it deems necessary.

There was no comment on the second part of § 577.5 that deals with manufacturer notices in which remedy without charge is not required and is not volunteered. Accordingly, the paragraph is adopted as proposed.

## NOTIFICATION PURSUANT TO ADMINISTRATOR'S DETERMINATION

Section 577.6 provides for Administration-ordered notifications in accordance with § 152. Paragraphs (a), (b), and (c) set forth requirements for the three types of notification contemplated by the Act. Manufacturers made no comment on the requirements for notification ordered by the Administrator in the first instance, and paragraph (a) is accordingly made final as proposed.

PACCAR objected to provisional notification as placing an unreasonable burden on the manufacturer, rendering any court decision in its favor meaningless. Section 155(b) of the Act clearly contemplates such an order, however, and the regulations consequently do provide for it.

Comments were received on the proposed content of the provisional notification. The MVMA pointed out that the requirement in paragraph (b)(2) should be clarified to permit a statement that the defect or non-compliance may not occur in all the described vehicles. The agency agrees and adds a paragraph similar to § 577.5(d).

With regard to the proposed paragraph (b)(4), the MVMA asked that reference to a "United States District Court" be broadened to "the Federal courts" and that the statement make clear that the NHTSA and not the court is ordering provisional notification. The agency concurs in these clarifications and they are made where appropriate in the final rule.

The requirements of paragraphs (b)(5), (6), and (7) provide for a description of the Administrator's determination, his evaluation of the hazard, and the recommended measures to avoid unreasonable hazard resulting from the defect or noncompliance. Fiat requested that the description, evaluation, and recommended measures be provided by the NHTSA. As specified in the requirements, it is the "Administrator's stated basis" that must be described, and the measures "stated in his order" that must be listed. The agency intends to include in each order a description, evaluation, and list of measures that permit quotation or paraphrase by the manufacturer.

Chrysler and the MVMA asked that a manufacturer be permitted more latitude to explain



its position than provided for in paragraph (b)(8). The agency has considered this request, and concludes that extensive advocacy of the manufacturer's position would detract from the intent of the provisional notification to put the owner on notice of potential problems. The Chrysler and MVMA suggestion is therefore not adopted.

In the required statement dealing with availability of remedy and reimbursement in the event the court upholds the Administrator's determination (paragraph (b)(9)), Chrysler argued that the suggestion of reimbursement would generate poor customer relations if a repair were sought or undertaken during pendency of a court proceeding in which the manufacturer prevailed. The agency is aware of the possibility for some misunderstanding but is certain that the provisional notification was intended by the Congress to encourage owners to consider repair or other corrective action while the manufacturer contests the determination. For this reason, the notice of possible reimbursement remains in the regulation. The first statement in (b)(9)(i) has been clarified in one minor respect.

The MVMA requested that the phrase "for repair" be substituted for "in repairing" to permit manufacturers to make clear that reimbursement would only cover the repairs that were reasonable and necessary to correct the defect or noncompliance. The NHTSA believes that the term "reasonable and necessary" makes clear what repairs would be reimbursed should the court uphold an Administrator's determination.

The MVMA asked, and the agency agrees, that the reimbursement statement be qualified by the limitations that appear in the statute.

Paragraph (b)(10) requires a statement whether, in the manufacturer's opinion, a repair of the defect or noncompliance is possible. GM asked that "feasible" be substituted for "possible" and the agency makes the change in agreement that it more clearly reflects the judgement made by a manufacturer in choosing its preferred remedy. The MVMA and Chrysler made the more basic objection that (b)(10) assumes that a defect or noncompliance exists prior to the court's ruling, and that it requires unjustified effort to develop repair parts and facilities before a decision is reached on the validity of the Ad-

ministrator's determination. The agency is of the view that the level of detail specified is justified in these cases and necessary to fulfill the purpose of provisional notification contemplated by Congress. The agency has modified the wording to make clear that reimbursement for expenses are limited to those necessary and reasonable for repair.

With regard to proposed paragraph (b)(12), the MVMA asked that only notification and not remedy be mentioned. There will be a discussion of remedy in the notification, however, and the owner should be encouraged to inquire further as to this aspect of the notification.

Firestone and the Automotive Parts and Accessories Association felt that the regulations should apply to the agency and that it should be required to advise the owner, purchaser, and dealer in the event its determination is not upheld by the courts. The statutory scheme being implemented by Part 577 concerns manufacturer obligations under §§ 151 through 160 of the Act to notify and remedy safety problems in vehicles. The agency does not consider an expansion of the regulations beyond this purpose as appropriate. Nothing, of course, prevents the manufacturer from making such a notice to the owner or others.

Paragraph (c) of § 577.6 deals with final notification following a court decision in the Administrator's favor, and it is adopted, with corrections similar to those made in the other sections. Because the MVMA objected to reference to being "upheld in a proceeding in a United States District Court" as the basis for the post-litigation order, the agency has substituted the language of the Act. Also, reference to "a date" on which provisional notification was ordered is corrected to "the date" to reflect that it will in all cases be a specific date.

#### TIME AND MANNER OF NOTIFICATION

The major problem with regard to the time and manner of notification concerned the statutory requirement (§ 153(c)(1)) that notification be,

§ 153 \* \* \*

(c) \* \* \*

(1) in the case of a motor vehicle, by first class mail to each person who is registered



under State law as the owner of such vehicle and whose name and address is reasonably ascertainable by the manufacturer through State records or other sources available to him;

PACCAR, Volkswagen, and IH expressed their doubts that all State records would be available or that alternative services would provide timely information. The agency has incorporated the statutory requirements in this regulation word-for-word and, on that basis, declines to modify it. As for the suggestion that "reasonably ascertainable" be defined, it is the agency's view that the phrase is only given meaning by the separate factual situations that arise. The agency cannot agree with PACCAR that records are not "reasonably ascertainable" simply by virtue of delay in retrieving them.

Sheller-Globe Corporation asked if certified mail would be considered the equivalent of first class mail for meeting the requirements. As a school bus manufacturer, Sheller-Globe wanted certainty of notification to school districts and other customers. The NHTSA does not consider them equivalent in view of relevant legislative history. Congress considered the U.S. Postal Service regulation that prohibits forwarding of certified mail and they concluded that first class mail would be a superior means of obtaining notification.

With regard to the maximum times permitted for issuance of notification, the Center asked that the period be reduced to 30 days in the case of all Administration-ordered notifications. Some manufacturers asked that the 30-day period for provisional notification be expanded to 60 days. B.F. Goodrich stated that notification letters cannot be printed in advance of actual mailing, because the date for earliest remedy must be included in the letter. The agency has weighed the conflicting views, and concludes that a 60-day period is justified for administration-ordered recalls. The provisional notification requirement is amended accordingly.

IH suggested that public notice of defects or noncompliances in items of replacement equipment would be adequate, and that notice to the most recent purchaser should be optional. The

agency has simply conformed its regulation to the statutory requirements of § 153(c).

## OTHER MATTERS

The MVA suggested that the disclaimer section of the regulation could be clarified by an additional paragraph permitting manufacturer statements that a notification does not "constitute an admission by the manufacturer that it has been guilty of negligence or other wrong doing." The agency views this statement as exactly the type of disclaimer that could contribute to a reader's decision not to take action in response to notification and accordingly declines to adopt the MVMA recommendation.

With regard to the MVMA concern that technical violations of the regulations not be pursued as a violation of the Act under § 577.9, the agency expects to continue to enforce the Act and its regulations in a reasonable manner, calculated to avoid arbitrariness or irrationality.

After-market equipment manufacturers and their associations expressed the view that the notification scheme was unworkable for notice to equipment purchasers, that wear of parts in normal use conflicted with the concept of safety-related defects, and that the 8-year period for remedy without charge was too long. Also, the establishment of a cut-off based on the date of retail sale appeared impractical, because records of these transactions are not maintained. As a response, the agency notes that the regulation conforms to the statute's language and clearly expressed Congressional intent. Experience to date with the requirements does not demonstrate that they are in fact unworkable. The issues of improper installation and remanufactured parts were not addressed by the statute, and resolution of these issues will require some experience with situations as they arise.

The RVIA asked that the agency exercise its authority to require the submission to manufacturers by dealers of the names and addresses of purchasers. The agency takes this recommendation under advisement but, as it is beyond the scope of Part 577, does not act on it in this notice.

In consideration of the foregoing, Part 577, "Defect Notification," of Title 49, Code of Fed-

eral Regulations, is renamed "Defect and Non-compliance Notification" and is amended to read as set forth below.

Effective date: June 28, 1977.

(Secs. 108, 112, 119, Pub. L. 89-563, 80 Stat. 718; Sec. 102, 103, 104, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1397, 1401, 1407, 1411-1420; delegation of authority at 49 CFR 1.50)

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Issued on December 22, 1976.

John W. Snow  
Administrator

**41 F.R. 56813**  
**December 30, 1976**





## PREAMBLE TO AN AMENDMENT TO PART 577

### Defect and Noncompliance Notification (Docket No. 80-17; Notice 1)

**ACTION:** Final rule.

**SUMMARY:** This notice amends the defect and non-compliance notification regulation to require that manufacturers include the agency's toll free Auto Safety Hotline number in their defect and non-compliance notification letters. The amendment is being made to provide a means of easy access to the agency by consumers who may have complaints about the recall and remedy of their vehicles or equipment. Since it is a minor technical amendment, it is being made effective immediately without notice or opportunity for comment.

**EFFECTIVE DATE:** January 22, 1981.

**FOR FURTHER INFORMATION CONTACT:**

Mr. James Murray, Office of Defects  
Investigation, National Highway Traffic  
Safety Administration, 400 Seventh Street,  
S.W., Washington, D.C. 20590,  
202-426-2840

**SUPPLEMENTARY INFORMATION:** This notice makes a minor technical amendment to Part 577, Defect and Noncompliance Notification, to require manufacturers conducting recall campaigns to include the agency's toll free Auto Safety Hotline number in the notification letters.

Existing notification letters are required to state that a consumer may contact the agency if he or she feels that remedy of a defect or non-compliance is not being made without charge or in a reasonable time. Manufacturers also frequently include their address and a toll free number that consumers can call to complain to the manufacturer about the status of a remedy. The agency believes that the use of manufacturer toll free numbers is a good idea and has decided that the agency's toll free number should also be included

in the letter. This will provide easy access for consumers to the agency for reporting any complaints concerning the recall or remedy of their vehicles. It also will provide timely information to our Enforcement office pertaining to the compliance with our regulations by the manufacturers.

Since this is a minor technical amendment and will result in little impact upon manufacturers, the agency finds for good cause shown that it is in the interest of safety to make the amendment effective immediately without notice and opportunity for comment.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations, Part 577, Defect and Noncompliance Notification, is amended by revising the introductory sentence in paragraph 577.5(g)(1)(vii) to read as follows:

(vii) A statement informing the owner that he or she may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call the toll free Auto Safety Hotline at 800-426-9393 (Washington, D.C. area residents may call 426-0123), if the owner believes that—

\* \* \* \*

The principal authors of this notice are Mr. James Murray of the Office of Defects Investigations and Roger Tilton of the Office of Chief Counsel.

Issued on January 14, 1981.

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Joan Claybrook  
Administrator

46 FR 6971  
January 22, 1981



## PART 577—DEFECT AND NONCOMPLIANCE NOTIFICATION

(Docket No. 72-7; Notice 2)

Sec.

### 577.1 Scope.

### 577.2 Purpose.

### 577.3 Application.

### 577.4 Definitions.

### 577.5 Notification pursuant to a manufacturer's determination.

### 577.6 Notification pursuant to the Administrator's determination.

### 577.7 Time and manner of notification.

### 577.8 Disclaimers.

### 577.9 Conformity to statutory requirements.

AUTHORITY: Secs. 108, 112, 119, Pub. L. 89-563; 80 Stat. 718; Secs. 102, 103, 104, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1397, 1401, 1408, 1411-1420; delegations of authority at 49 CFR 1.51 and 49 CFR 501.8)

### § 577.1 Scope.

This part sets forth requirements for notification to owners of motor vehicles and replacement equipment about the possibility of a defect which relates to motor vehicle safety or a non-compliance with a Federal motor vehicle safety standard.

### § 577.2 Purpose.

The purpose of this part is to ensure that notifications of defects or noncompliances adequately inform and effectively motivate owners of potentially defective or noncomplying motor vehicles or items of replacement equipment to have such vehicles or equipment inspected and, when necessary, remedied as quickly as possible.

### § 577.3 Application.

This part applies to manufacturers of completed motor vehicles, incomplete motor vehicles, and replacement equipment. In the case of vehicles manufactured in two or more stages, compliance by either the manufacturer of the incomplete vehicle, any subsequent manufacturer, or the manufacturer of affected replacement equipment shall be considered compliance by each of those manufacturers.

### § 577.4 Definitions.

For purposes of this part:

"Act" means the National Traffic and Motor Vehicle Safety Act of 1966, as amended, 15 U.S.C. 1391 et seq.

"Administrator" means the Administrator of the National Highway Traffic Safety Administration or his delegate.

"First purchaser" means the first purchaser in good faith for a purpose other than resale.

"Owners" include purchaser.

### § 577.5 Notification pursuant to a manufacturer's determination.

(a) When a manufacturer of motor vehicles or replacement equipment determines that any motor vehicle or item of replacement equipment produced by him contains a defect which relates to motor vehicle safety, or fails to conform to an applicable Federal motor vehicle safety standard, he shall provide notification in accordance with paragraph (a) of § 577.7, unless the manufacturer is exempted by the Administrator (pursuant to section 157 of the Act) from giving such notification. The notification shall contain the information specified in this section. The information required by paragraphs (b) and (c) of this section shall be presented in the form and order specified. The information required



by paragraphs (d) through (g) of this section may be presented in any order. Notification sent to an owner whose address is in either the Commonwealth of Puerto Rico or the Canal Zone shall be written in both English and Spanish.

(b) An opening statement: "This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act."

(c) Whichever of the following statements is appropriate:

(1) "(Manufacturer's name or division) has determined that a defect which relates to motor vehicle safety exists in (identified motor vehicles, in the case of notification sent by a motor vehicle manufacturer; identified replacement equipment, in the case of notification sent by a replacement equipment manufacturer);" or

(2) "(Manufacturer's name or division) has determined that (identified motor vehicles, in the case of notification sent by a motor vehicle manufacturer; identified replacement equipment, in the case of notification sent by a replacement equipment manufacturer) fail to conform to Federal Motor Vehicle Safety Standard No. (number and title of standard)."

(d) When the manufacturer determines that the defect or noncompliance may not exist in each vehicle or item of replacement equipment, he may include an additional statement to that effect.

(e) A clear description of the defect or noncompliance, which shall include—

(1) An identification of the vehicle system or particular item(s) of motor vehicle equipment affected.

(2) A description of the malfunction that may occur as a result of the defect or noncompliance. The description of a noncompliance with an applicable standard shall include, in general terms, the difference between the performance of the noncomplying vehicle or item of replacement equipment and the performance specified by the standard;

(3) A statement of any operating or other conditions that may cause the malfunction to occur; and

(4) A statement of the precautions, if any, that the owner should take to reduce the chance that the malfunction will occur before the defect or noncompliance is remedied.

(f) An evaluation of the risk to motor vehicle safety reasonably related to the defect or noncompliance.

(1) When vehicle crash is a potential occurrence, the evaluation shall include whichever of the following is appropriate:

(i) A statement that the defect or noncompliance can cause vehicle crash without prior warning; or

(ii) A description of whatever prior warning may occur, and a statement that if this warning is not heeded, vehicle crash can occur.

(2) When vehicle crash is not a potential occurrence, the evaluation must include a statement indicating the general type of injury to occupants of the vehicle, or to persons outside the vehicle, that can result from the defect or noncompliance, and a description of whatever prior warning may occur.

(g) A statement of measures to be taken to remedy the defect or noncompliance, in accordance with paragraph (g) (1) or (g) (2) of this section, whichever is appropriate.

(1) When the manufacturer is required by the Act to remedy the defect or noncompliance without charge, or when he will voluntarily so remedy in full conformity with the Act, he shall include—

(i) A statement that he will cause such defect or noncompliance to be remedied without charge, and whether such remedy will be by repair, replacement, or (except in the case of replacement equipment) refund, less depreciation, of the purchase price.

(ii) The earliest date on which the defect or noncompliance will be remedied without charge. In the case of remedy by repair, this date shall be the earliest date on which the manufacturer reasonably expects that dealers or other service facilities will receive necessary parts and instructions. The manufacturer shall specify the last date, if any,

on which he will remedy tires without charge.

(iii) In the case of remedy by repair through the manufacturer's dealers or other service facilities:

(A) A general description of the work involved in repairing the defect or non-compliance; and

(B) The manufacturer's estimate of the time reasonably necessary to perform the labor required to correct the defect or non-compliance.

(iv) In the case of remedy by repair through service facilities other than those of the manufacturer or its dealers:

(A) The name and part number of each part that must be added, replaced, or modified;

(B) A description of any modifications that must be made to existing parts which shall also be identified by name and part number;

(C) Information as to where needed parts will be available;

(D) A detailed description (including appropriate illustrations) of each step required to correct the defect or noncompliance;

(E) The manufacturer's estimate of the time reasonably necessary to perform the labor required to correct the defect or non-compliance; and

(F) The manufacturer's recommendations of service facilities where the owner should have the repairs performed.

(v) In the case of remedy by replacement, a description of the motor vehicle or item of replacement equipment that the manufacturer will provide as a replacement for the defective or noncomplying vehicle or equipment.

(vi) In the case of remedy by refund of purchase price, the method or basis for the manufacturer's assessment of depreciation.

(vii) A statement informing the owner that he or she may submit a complaint to the Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 or call the toll-free Auto Safety Hotline at 800-426-9393 (Washington D.C. area residents may call 426-0123), if the owner believes that—

(A) The manufacturer, distributor, or dealer has failed or is unable to remedy the defect or noncompliance without charge.

(B) The manufacturer has failed or is unable to remedy the defect or noncompliance without charge—

(1) (In the case of motor vehicles or items of replacement equipment, other than tires) within a reasonable time, which is not longer than 60 days in the case of repair after the owner's first tender to obtain repair following the earliest repair date specified in the notification, unless the period is extended by the Administrator.

(2) (In the case of tires) after the date specified in the notification on which replacement tires will be available.

(2) When the manufacturer is not required to remedy the defect or noncompliance without charge and he will not voluntarily so remedy, the statement shall include—

(i) A statement that the manufacturer is not required by the Act to remedy without charge.

(ii) A statement of the extent to which the manufacturer will voluntarily remedy, including the method of remedy and any limitations and conditions imposed by the manufacturer on such remedy.

(iii) The manufacturer's opinion whether the defect or noncompliance can be remedied by repair. If the manufacturer believes that repair is possible, the statement shall include the information specified in paragraph (g) (1) (iv) of this section, except that—

(A) The statement required by paragraph (g) (1) (iv) (A) of this section shall also indicate the suggested list price of each part.

(B) The statement required by paragraph (G) (1) (iv) (C) of this section shall also indicate the manufacturer's estimate of the date on which the parts will be generally available.



**§ 577.6 Notification pursuant to Administrator's determination.**

(a) *Manufacturer-ordered-notification.* When a manufacturer is ordered pursuant to section 152 of the Act to provide notification of a defect or noncompliance, he shall provide such notification in accordance with §§ 577.5 and 577.7, except that the statement required by paragraph (c) of § 577.5 shall indicate that the determination has been made by the Administrator of the National Highway Traffic Safety Administration.

(b) *Provisional notification.* When a manufacturer does not provide notification as required by paragraph (a) of this section, and an action concerning the Administrator's order to provide such notification has been filed in a United States District Court, the manufacturer shall, upon the Administrator's further order, provide in accordance with paragraph (b) of § 577.7 a provisional notification containing the information specified in this paragraph, in the order and, where specified, the form of paragraphs (b) (1) through (b) (12) of this section.

(1) An opening statement: "This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act."

(2) Whichever of the following statements is appropriate:

(i) "The Administrator of the National Highway Traffic Safety Administration has determined that a defect which relates to motor vehicle safety exists in (identified motor vehicles, in the case of notification sent by a motor vehicle manufacturer; identified replacement equipment, in the case of notification sent by a replacement equipment manufacturer);" or

(ii) "The Administrator of the National Highway Traffic Safety Administration has determined that (identified motor vehicles, in the case of notification sent by a motor vehicle manufacturer; identified replacement equipment, in the case of notification sent by a replacement equipment manufacturer) fail to conform to Federal Vehicle Safety Standard No. (number and title of standard)."

(3) When the Administrator determines that the defect or noncompliance may not exist in each such vehicle or item of replacement equipment, the manufacturer may include an additional statement to that effect.

(4) The statement: "(Manufacturer's name or division) is contesting this determination in a proceeding in the Federal courts and has been required to issue this notice pending the outcome of the court proceeding."

(5) A clear description of the Administrator's stated basis for his determination, as provided in this order, including a brief summary of the evidence and reasoning that the Administrator relied upon in making his determination.

(6) A clear description of the Administrator's stated evaluation as provided in his order of the risk to motor vehicle safety reasonably related to the defect or noncompliance.

(7) Any measures that the Administrator has stated in his order should be taken by the owner to avoid an unreasonable hazard resulting from the defect or noncompliance.

(8) A brief summary of the evidence and reasoning upon which the manufacturer relies in contesting the Administrator's determination.

(9) A statement regarding the availability of remedy and reimbursement in accordance with paragraph 9(i) or 9(ii) below, whichever is appropriate.

(i) When the purchase date of the vehicle or item of equipment is such that the manufacturer is required by the Act to remedy without charge or to reimburse the owner for reasonable and necessary repair expenses, he shall include—

(A) A statement that the remedy will be provided without charge to the owner if the Court upholds the Administrator's determination.

(B) A statement of the method of remedy. If the manufacturer has not yet determined the method of remedy, he shall indicate that he will select either repair, replacement with an equivalent vehicle or item of replacement equipment, or (except



in the case of replacement equipment) refund, less depreciation, of the purchase price; and

(C) A statement that, if the Court upholds the Administrator's determination, he will reimburse the owner for any reasonable and necessary expenses that the owner incurs (not in excess of any amount specified by the Administrator) in repairing the defect or noncompliance following a date, specified by the manufacturer, which shall not be later than the date of the Administrator's order to issue this notification.

(ii) When the manufacturer is not required either to remedy without charge or to reimburse, he shall include—

(A) A statement that he is not required to remedy or reimburse, or

(B) A statement of the extent to which he will voluntarily remedy or reimburse, including the method of remedy if then known, and any limitations and conditions on such remedy or reimbursement.

(10) A statement indicating whether, in the manufacturers opinion, the defect or noncompliance can be remedied by repair. When the manufacturer believes that such remedy is feasible, the statement shall include:

(i) A general description of the work and the manufacturer's estimate of the costs involved in repairing the defect or noncompliance;

(ii) Information on where needed parts and instructions for repairing the defect or noncompliance will be available, including the manufacturer's estimate of the day on which they will be generally available;

(iii) The manufacturer's estimate of the time reasonably necessary to perform the labor required to correct the defect or noncompliance; and

(iv) The manufacturer's recommendations of service facilities where the owner could have the repairs performed, including (in the case of a manufacturer required to reimburse if the Administrator's determination is upheld in the court proceeding) at least

one service facility for whose charges the owner will be fully reimbursed if the Administrator's determination is upheld.

(11) A statement that further notice will be mailed by the manufacturer to the owner if the Administrator's determination is upheld in the court proceeding; and

(12) An address of the manufacturer where the owner may write to obtain additional information regarding the notification and remedy.

(c) *Post-litigation notification.* When a manufacturer does not provide notification as required in paragraph (a) of this section and the Administrator prevails in an action commenced with respect to such notification, the manufacturer shall, upon the Administrator's further order, provide notification in accordance with paragraph (b) of § 577.7 containing the information specified in paragraph (a) of this section, except that—

(1) The statement required by paragraph (c) of § 577.5 shall indicate that the determination has been made by the Administrator and that his determination has been upheld in a proceeding in the Federal courts; and

(2) When a provisional notification was issued regarding the defect or noncompliance and the manufacturer is required under the Act to reimburse—

(i) The manufacturer shall state that he will reimburse the owner for any reasonable and necessary expenses that the owner incurred (not in excess of any amount specified by the Administrator) for repair of the defect or noncompliance of the vehicle or item of equipment on or after the date on which provisional notification was ordered to be issued and on or before a date not sooner than the date on which this notification is received by the owner. The manufacturer shall determine and specify both dates.

(ii) The statement required by paragraph (g)(1)(vii) of § 577.5 shall also inform the owner that he may submit a complaint to the Administrator if the owner believes that the manufacturer has failed to reimburse adequately.

(3) If the manufacturer is not required under the Act to reimburse, he shall include—

(i) A statement that he is not required to reimburse, or

(ii) When he will voluntarily reimburse, a statement of the extent to which he will do so, including any limitations and conditions on such reimbursement.

#### **§ 577.7 Time and manner of notification.**

(a) The notification required by § 577.5 shall—

(1) Be furnished within a reasonable time after the manufacturer first determines the existence of a defect which relates to motor vehicle safety, or of a noncompliance.

(2) Be accomplished—

(i) In the case of a notification required to be sent by a motor vehicle manufacturer, by first class mail to each person who is registered under State law as the owner of the vehicle and whose name and address are reasonably ascertainable by the manufacturer through State records or other sources available to him. If the owner cannot be reasonably ascertained, the manufacturer shall notify the most recent purchaser known to the manufacturer.

(ii) In the case of a notification required to be sent by a replacement equipment manufacturer—

(A) By first class mail to the most recent purchaser known to the manufacturer, and

(B) (Except in the case of a tire) if determined by the Administrator to be necessary for motor vehicle safety, by public notice in such manner as the Administrator may determine after consultation with the manufacturer.

(iii) In the case of a manufacturer required to provide notification concerning any defective or noncomplying tire, by first class or certified mail.

(b) The notification required by any paragraph of § 577.6 shall be provided:

(1) Within 60 days after the manufacturer's receipt of the Administrator's order to provide the notification, except that the notification shall be furnished within a shorter or longer period if the Administrator incorporates in his order a finding that such period is in the public interest; and

(2) In the manner and to the recipients specified in paragraph (a) of this section.

#### **§ 577.8 Disclaimers.**

(a) A notification sent pursuant to § 577.5 or § 577.6 regarding a defect which relates to motor vehicle safety shall not, except as specifically provided in this part, contain any statement or implication that there is no defect, that the defect does not relate to motor vehicle safety, or that the defect is not present in the owner's vehicle or item of replacement equipment.

(b) A notification sent pursuant to § 577.5 or § 577.6 regarding a noncompliance with an applicable Federal motor vehicle safety standard shall not, except as specifically provided in this part, contain any statement or implication that there is not a noncompliance or that the noncompliance is not present in the owner's vehicle or item of replacement equipment.

#### **§ 577.9 Conformity to statutory requirements.**

A notification that does not conform to the requirements of this part is a violation of the Act.

**38 F.R. 2215**

**January 23, 1973**



## PREAMBLE TO PART 579—DEFECT AND NONCOMPLIANCE RESPONSIBILITY

(Docket No. 75-30; Notice 2)

This notice issues a new regulation, Part 579, *Defect and Noncompliance Responsibility*. The purpose of the regulation is to allocate between motor vehicle and equipment manufacturers the responsibilities under the 1974 Motor Vehicle and Schoolbus Safety Amendments for recalling and remedying defective or noncomplying motor vehicles and equipment. The regulation makes tire manufacturers responsible for original equipment tires as well as tires sold as replacement equipment. Otherwise, the regulation adopts the responsibility scheme in the 1974 Amendments. With this notice, the agency defers final action on its proposal concerning the responsibilities of original equipment manufacturers that supply equipment to five or more vehicle manufacturers. Effective date: September 30, 1978.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Mr. James Murray, Office of Defects Investigation, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2840).

This notice issues a new regulation, Part 579, *Defect and Noncompliance Responsibility*. A notice of proposed rulemaking was published on December 5, 1975 (40 F.R. 56930) proposing some reallocation between motor vehicle and equipment manufacturers of the responsibilities for safety-related defects and noncompliances with safety standards. These responsibilities include the duty to notify purchasers of any safety-related defects or noncompliances with safety standards and to make remedy without charge to the purchaser. Currently, the allocation of defect and noncompliance responsibility is governed by section 159(2) of the National Traffic

and Motor Vehicle Safety Act of 1966, as amended, (the Act) (15 U.S.C. 1419(2)).

The Act authorizes the agency to allocate equitably responsibility for defects and noncompliances between equipment and vehicle manufacturers. The substance of the agency's 1975 NPRM was to shift the burdens of compliance somewhat from the vehicle to the equipment manufacturer. As the NPRM on this issue stated, the legislative history of the Act indicates that the Congress intended for the agency to ensure that its defect and noncompliance regulations reflect the realities of the relationship between equipment and vehicle manufacturers.

Comments were received from equipment and vehicle manufacturers and from their representatives. All comments were considered. The Vehicle Equipment Safety Commission did not submit comments.

General Motors Corporation suggested that section 579.1 be changed to indicate that the regulation applies only to Part B of the Act, Discovery, notification, and remedy of motor vehicle defects, not to Part A, General provisions. Since this regulation exercises the authority granted by section 159 of the Act and that section specifically states that it applies only to Part B of the Act, the agency has incorporated GM's recommended change.

The Midland Ross Corporation suggested that the agency add several minor definitions to the list of definitions. They suggested, for example, that the agency define phrases such as "an item of motor vehicle equipment," and "an item of defective or noncomplying equipment."

With respect to "motor vehicle equipment," the agency notes that the term is defined in the Act at section 102(4). Since the agency does not intend to alter that definition, the term is not defined in this section.



"Defective and noncomplying equipment" also does not require definition for purposes of this section, since "noncomplying equipment" obviously means equipment that does not comply with an applicable Federal motor vehicle safety standard. "Defective equipment," on the other hand, cannot be defined in a fashion that would be appropriate for all cases. Whether equipment is defective in a manner that requires action under the Act would depend upon the type of the equipment involved as well as the nature and extent of the defect. As such, "defective" is a legal determination made on a case-by-case basis and the term, therefore, cannot be absolutely defined in advance.

Many manufacturers complained about NHTSA's definition of "original equipment." The Eaton and Bendix Corporations, for example, indicated that they thought NHTSA had violated its authority to issue regulations with respect to this term. They suggested that section 159 does not grant sufficient latitude for the agency to alter the Act's definitions to the extent found in the regulation. The agency disagrees. The language in section 159, "Except as otherwise provided in regulations of the Secretary," and the legislative history of that section very clearly permit the agency to modify the definitions of section 159 of the Act if the agency determines that it would be in the interest of an equitable distribution of enforcement responsibilities upon the various manufacturers. In this instance, the agency has determined that the minor definitional changes included in this regulation will better meet the needs of both the agency and the manufacturers for efficient recalls and remedies.

Several commenters questioned the term "express authorization" as it is used in Part 579.4 (a)(2). The agency stated in the NPRM preamble that express authorization was not limited to written authorization and that "any type of express authorization given by the vehicle manufacturer for the installation of equipment should be sufficient to make the manufacturer responsible for that equipment." The preamble went on to state that "what constitutes adequate authorization will depend upon the facts of each case." Since the issuance of the preamble, nothing has occurred that leads to a simplified defini-

tion of the term "express authorization." Therefore, the agency declines to adopt a definition for this term and restates that it depends upon the circumstances of each case.

Several commenters indicated that proposed paragraph (1) under section 579.4(a) was overbroad in that it required a vehicle manufacturer to be responsible for equipment manufactured by him even when that equipment was not installed by him or at his direction. NHTSA agrees with these commenters and has deleted paragraph (1) from that section and renumbered the section accordingly.

Section 579.4(b) defines "replacement equipment" to include tires. The commenters on this paragraph, Goodyear and Firestone, agreed with this definition. They stated that they thought it appropriate for tire manufacturers to be responsible for defects and noncompliances in their equipment.

With respect to the application of this regulation to the tire manufacturers, several misunderstandings occurred. Fruehauf Corporation indicated that the fabricating manufacturer of a tire should be the one responsible for the recall of those tires and not the brand name owner. The agency has held the brand name manufacturer responsible in the past for tire identification and recordkeeping (Part 574). The Act in section 159(1) holds brand name owners of tires responsible for defects and noncompliances by specifying that the brand name owner shall be deemed the manufacturer of the tires. The agency sees no reason to alter this established pattern of responsibility. However, a fabricating manufacturer and brand name manufacturer might establish by contract that the fabricating manufacturer would conduct all notification and recall campaigns.

In the preamble to the NPRM, the agency erroneously stated that tire manufacturers were required to retain the names and addresses of the owners of vehicles upon which their tires were mounted as original equipment. Tire manufacturers pointed out that this was inaccurate. Part 574 requires tire manufacturers to retain lists of people to whom their tires were sold, including vehicle manufacturers. The vehicle manufacturer would have the names of the owners of the

vehicles upon which potentially defective or non-complying tires were mounted and, if necessary, would supply that list to a tire manufacturer undertaking a recall campaign.

Proposed Part 579.5(a) and (b) received very few comments. Commenters to these provisions suggested only minor modifications in their language. GM and the Motor Vehicle Manufacturers Association suggested that the term "safety-related" be added to both sections before defect to indicate that manufacturers only had responsibilities for such defects. Under the Act, manufacturers need only recall and remedy defects that are in fact determined to be safety-related. Accordingly, the agency agrees with the commenters and amends the language of the section accordingly.

GM stated that the last part of paragraph (a) of proposed section 579.5 is unnecessary. That part of the sentence that read "installed on or in the vehicle at the time of its delivery to the first purchaser" is identical to the sentence in section 579.4(a) that defines original equipment. Therefore, its inclusion at this point is redundant and unnecessary. The agency has modified the section by the deletion of that portion of the sentence.

NHTSA is publishing this regulation without taking final action on proposed section 579.5(c), and is modifying 579.5(a) to delete all reference to paragraph (c). Paragraph (c) would have placed defect and noncompliance responsibilities upon equipment manufacturers that supplied

equipment to five or more vehicle manufacturers. This action is being taken without making any substantive determination on the merits of paragraph (c). A subsequent notice will deal with that paragraph and the comments thereon. However, due to the delay in the issuance of this Part and mindful of the fact that the modified definitions are important to the agency's enforcement scheme, NHTSA has determined that it is in the interest of efficiency to adopt the definitions sections of this regulation as proposed with some minor modifications, while retaining a responsibility section that basically retains the same responsibility provisions as the Act.

The agency has reviewed this regulation with respect to its potential costs and other impacts and has determined that any costs or other impacts will be minimal.

Accordingly, Title 49 of the Code of Federal Regulations is amended by the addition of Part 579 . . . .

(Secs. 103, 108, 112, 113, Pub. L. 89-563, 80 Stat. 718, Sec. 102, Pub. L. 93-492, 88 Stat. 1470 (15 U.S.C. 1392, 1397, 1401, 1411-1420; delegation of authority at 49 CFR 1.50.)

Issued on August 24, 1978.

Joan Claybrook  
Administrator

**43 F.R. 38833-38834**  
**August 31, 1978**





## PART 579—DEFECT AND NONCOMPLIANCE AND RESPONSIBILITY

### Sec.

#### 579.1 Scope.

#### 579.2 Purpose.

#### 579.3 Application.

#### 579.4 Definitions.

#### 579.5 Defect and noncompliance responsibility.

##### § 579.1 Scope.

This part sets forth the responsibilities under Part B of the Act of manufacturers for safety-related defects and noncompliances with Federal motor vehicle safety standards in motor vehicles and items of motor vehicle equipment.

##### § 579.2 Purpose.

The purpose of this part is to facilitate the notification of owners of defective and non-complying motor vehicles and items of motor vehicle equipment, and the remedy of defective and noncomplying vehicles and items of equipment, by equitably reapportioning the responsibility for safety-related defects and noncompliances with Federal motor vehicle safety standards among manufacturers of motor vehicles and motor vehicle equipment.

##### § 579.3 Application.

This part applies to all manufacturers of motor vehicles and motor vehicle equipment.

##### § 579.4 Definitions.

(a) "Original equipment" means an item of motor vehicle equipment (other than a tire) which was installed in or on a motor vehicle at the time of its delivery to the first purchaser if—

(1) The item of equipment was installed on or in the motor vehicle at the time of its delivery to a dealer or distributor for distribution; or

(2) The item of equipment was installed by the dealer or distributor with the express authorization of the motor vehicle manufacturer.

(b) "Replacement equipment" means—

(1) Motor vehicle equipment other than original equipment as defined in paragraph (a) of this section; and

(2) Tires.

(c) "The Act" means the National Traffic and Motor Vehicle Safety Act of 1966, as amended.

##### § 579.5 Defect and noncompliance responsibility.

(a) Each manufacturer of a motor vehicle shall be responsible for any safety-related defect or any noncompliance determined to exist in the vehicle or in any item of original equipment.

(b) Each manufacturer of an item of replacement equipment shall be responsible for any safety-related defect or any noncompliance determined to exist in the equipment.

43 F.R. 38835

August 31, 1978



**PREAMBLE TO PART 580—ODOMETER DISCLOSURE REQUIREMENTS**

(Docket No. 72-31; Notice 2)

The purpose of this notice is to establish a regulation that will require a person who transfers ownership in a motor vehicle to give his buyer a written disclosure of the mileage the vehicle has traveled. The regulation carries out the directive of section 408(a) of the Motor Vehicle Information and Cost Savings Act, Public Law 92-513, 86 Stat. 947, and completes the provisions of the Act under Title IV, Odometer Requirements.

The regulation was first proposed in a notice published in the *Federal Register* on December 2, 1972 (37 F.R. 25727). As a result of numerous comments on the proposal, the regulation as issued today differs in some respects from its initial form.

As stated in the proposal, the agency's goals were to link the disclosure statement as closely as possible to the documents required for transfer of ownership, so that buyers and sellers would know of the need for disclosure, and to do so in a manner that would not introduce an additional document into motor vehicle transactions. The agency therefore proposed the use of the certificate of title as the document for odometer disclosure.

Upon review of the comments, it became evident that in most jurisdictions it would not be feasible to use the title certificate to convey odometer information. The main drawback to its use lies in the prevalence of state laws providing that if a vehicle is subject to a lien, the title is held by the lienholder. As a result, it appears that in a majority of cases private parties selling motor vehicles do not have possession of a certificate of title, and convey their interest by other means.

In those States that permit the owner of a vehicle subject to a lien to retain the title, the

lienholder will be unable to make the odometer disclosure on the title if he attempts to sell the vehicle after repossession. In many States, furthermore, the title certificate is not large enough to contain an adequate odometer disclosure, and the existing data processing and filing equipment would not accommodate an enlarged certificate.

There appears to have been some apprehension that the Federal government intended to compel the States to amend their certificates of title. The Act does not, however, confer any authority over the States in this regard. Even if the regulation were to require transferor disclosure on the title, the States could decline to provide a form for disclosure on the title. This voluntary aspect of the States' participation is a further impediment to the use of the title certificate.

After review of the problems created by the use of the certificate of title, the agency has decided that the purposes of the Act are better served by prescribing a separate form as the disclosure document in most cases. Section 580.4 has been amended accordingly. To avoid the need for duplicate State and Federal disclosures in States having odometer disclosure laws or regulations, the section permits the State form to be used in satisfaction of the Federal requirement, so long as it contains equivalent information and refers to the existence of a Federal remedy.

It should be noted that although the certificate of title is no longer required to be used for disclosure, it can still be used as the disclosure document if it contains the required information and if it is held by the transferor and given by him to the transferee. The basic concept is that the disclosure must be made as part of the transfer, and not at some later time.



In addition to the changes from the proposal represented by the change from the certificate of title to a separate form, there are other differences from the proposal in the regulation. For purposes of convenience, the following discussion treats the amended sections in sequence.

In section 580.3, the proposed definition of transferor might in some jurisdictions include a person who creates a security interest in a vehicle. This type of transaction was not intended to be regulated, and the definitions have been amended accordingly.

In section 580.4, in addition to the changes discussed above, other modifications have been made. In response to a comment suggesting that the disclosure would be made after the purchaser had become committed to buying the vehicle, the order of § 580.4(a) has been rearranged to specify that the odometer disclosure is to be made before the other transfer documents are executed.

The items listed under § 580.4(a) have been increased to allow for additional identification of the vehicle and owner that would be necessary on a separate disclosure document. If the disclosure is a part of another document, however, § 580.4(a)(1) provides that items (2) through (4) need not be repeated if found elsewhere in the document. A number of comments noted that the items under (a) might often be redundant.

A new paragraph (b) has been inserted in § 580.4 to require a reference to the sanctions provided by the Act. No specific form is required, but the inclusion of such a statement is considered essential to notify the transferee of the reason why he is being given the odometer information.

The former paragraph (b) of § 580.4 has been renumbered as (c), and the alternative methods for odometer disclosure discussed above are found as paragraphs (d) and (e).

A new section, § 580.5, Exemptions, has been added in response to a number of comments that objected to the application of the requirements to categories of vehicles for which the odometer is not used as a guide to value. Buses and large trucks, for example, are routinely driven hundreds of thousands of miles, and their main-

tenance records have traditionally been relied on by buyers as the principal guide to their condition. The NHTSA is in agreement with the position taken by Freightliner, White, and the National Association of Motor Bus Operators, and has therefore created an exemption for larger vehicles. The exemption applies to vehicles having gross vehicle weight ratings of more than 16,000 pounds.

A second category of exempt vehicles has been created for antique vehicles, whose value is a function of their age, condition, and scarcity, and for which the odometer mileage is irrelevant. A third exempt category consists of vehicles that are not self-propelled, such as trailers, most of which are not equipped with odometers.

Several vehicle manufacturers stated that the proposal would require them to give disclosure statements to their distributors and dealers, and that such a requirement would be both burdensome and pointless. Upon consideration of the nature of manufacturer-dealer transactions, it has been decided to exempt transfers of new vehicles that occur prior to the first sale of the vehicle for purposes other than resale.

The odometer disclosure form set forth in § 580.6 has been reworded to make it clearer. Space for additional information about the vehicle and owner has been included so that the vehicle will be readily identifiable if the disclosure statement becomes separated from the other transfer documents. In accordance with the instructions of the Act, the transferor is directed to state that the mileage is unknown if he knows that the actual mileage differs from the mileage shown on the odometer. Although several comments suggested that the true mileage, if known, should be stated, such a statement is not provided for in the Act and would not afford the buyer with reliable information about the vehicle.

The effective date proposed in the notice was to have been six months after issuance. Two States, perhaps under the impression that they were required to change their forms, requested an additional six months. Other comments, notably that of the National Automobile Dealers Association, urged an immediate effective date in order to make the disclosure requirements coin-

cide with the effectiveness of the other parts of Title IV of the Act. Upon consideration of the important contribution the disclosure requirements make to the effectiveness of the Act's other provisions, it has been decided that an effective date earlier than six months after issuance is advisable.

Accordingly, the regulation is to become effective March 1, 1973. Although it is likely that most private persons will remain unaware of the disclosure requirements for some time after March 1, 1973, a person who does not know of the requirement will not have "intent to defraud" under section 409(a) of the Act and will therefore not be subject to liability solely because he has failed to make the required statement. The persons most immediately affected by the disclosure requirements are commercial enterprises such as dealers and wholesalers, and of these the

largest group, represented by NADA, has already indicated its desire for an early effective date. The earlier effective date is therefore considered appropriate.

In consideration of the foregoing, a new Part 580, Odometer Disclosure Requirements, is added to Title 49, Code of Federal Regulations, to read as set forth below.

Issued under the authority of section 408(a) of the Motor Vehicle Information and Cost Savings Act, P.L. 92-513, 86 Stat. 947, and the delegation of authority at 49 C.F.R. 1.51.

Issued on January 23, 1973.

Douglas W. Toms,  
Administrator.

**38 F.R. 2978**  
**January 31, 1973**





## PREAMBLE TO PART 580—ODOMETER DISCLOSURE REQUIREMENTS

(Docket No. 77-03; Notice 2)

This notice amends the odometer disclosure statement that must be executed upon each sale of a motor vehicle. The former statement often proved confusing and was sometimes used in a misleading manner. The amended statement is clearer and less likely to be misused.

Effective date: January 1, 1978.

For further information contact:

Kathleen DeMeter, Office of the Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, D.C. 20590 (202-426-1834).

**Supplementary information:** The disclosure statement is required by 49 CFR Part 580, Odometer Disclosure Requirements, a regulation issued by the National Highway Traffic Safety Administration (NHTSA) to implement the requirements of the Motor Vehicle Information and Cost Savings Act (Pub. L. 92-513, as amended by Pub. L. 94-364; 15 U.S.C. 1901-1991). The regulation, which has been in effect since March 1, 1973, requires each transferor of a motor vehicle to give the transferee a written statement attesting to the accuracy of the vehicle's odometer.

Experience with the regulation has shown several respects in which it should be improved. In response to a petition for rulemaking submitted by the National Automobile Dealers Association, and in recognition of the need for improvements in the disclosure statement, the NHTSA issued a notice on February 9, 1977 (42 F.R. 9045) which proposed changes in the form and content of the odometer disclosure statement.

*Differences between proposed and final rule.* The final rule differs from the proposed rule in several respects. The notice had proposed to require the disclosure form to include the last license plate number, State and year. In view of the number of commenters who stated that this

information was not needed to identify a vehicle or to trace a vehicle's history, the agency has decided to delete this requirement from the final rule.

The notice proposed a substantial enlargement of the disclosure form, including a certification that the odometer was either not altered, or altered for repair or replacement purposes only. This certification had been proposed in response to the NADA petition, and drew few critical comments. Two commenters raised Fifth Amendment questions concerning these additional boxes. The Department of Health, Education, and Welfare's Office of Consumer Affairs noted that these alternative certifications might give rise to possible violations of the transferor's right against self-incrimination since a willful false certification may amount to an admission of a violation of the Act. The NHTSA, however, believes that no Fifth Amendment problem could arise. In cases dealing with this issue the Supreme Court has held that where the dominant purpose of a record-keeping requirement is to compel criminals to keep incriminating records, the statute is invalid and the 5th Amendment may be invoked. However, where the record-keeping requirements have an independent purpose and do not involve a selective group which is inherently suspect of criminal activities, the statute is valid and the 5th Amendment may not be invoked. All businessmen, as well as all consumers, who sell automobiles would be required to execute odometer disclosure statements. Statements are not required only of those individuals who are most often found to tamper with odometers. The primary purpose of a statement is to inform a potential buyer of the car's mileage so that he may have an index to the condition and value of the vehicle. The fact that individuals who tamper with vehicle odometers would be executing in-

criminating records is not the dominant purpose of this requirement. Consequently, these provisions will be retained in the final rule with one minor change suggested by a commenter. In view of the fact that these certifications actually involve three separate statements, instead of two as indicated in the NPRM, the NHTSA had decided to divide the second certification into two: first, that the odometer was altered and the mileage is identical to that before repair; and second, that the odometer was altered and reset to zero, with a statement of the mileage on the original odometer or the odometer before repair.

Several commenters suggested that the transferee's name and address should be provided in a disclosure statement, in addition to his signature. This would provide a useful tool in tracing the vehicle's history and consequently, the NHTSA has decided to require that this information be included.

With the gradual conversion to the metric system now going on in the United States, the regulation has also been changed to provide for odometer readings that are expressed in kilometers where the vehicle records the distance traveled in metric units.

The bulk of the comments received were favorable. The primary objection was that the proposed final effective date of April 15, 1977, did not allow adequate time for new forms to be prepared and printed. In addition, it would have increased costs because it would not have allowed sufficient time for stocks of the present form to be depleted. In response to these comments, the agency has adopted an effective date of January 1, 1978.

One of the original goals of NHTSA was to link the disclosure statement as closely as possible to the documents required for transfer of ownership, so that buyers and sellers would know of the need for disclosure. To accomplish this goal in a manner that would not introduce an additional document into motor vehicle transactions, the agency proposed to use the certificate of title as the document for odometer disclosure.

The comments to that initial proposal persuaded the agency that providing the odometer reading on the title would not be feasible as the

sole method of disclosure. NHTSA still believes, however, that placing odometer information on the certificate of title will be useful both to consumers and to law enforcement officials. This belief is substantiated by a recent resolution of the National Association of Attorneys General, which endorsed odometer information on State certificates of title as the most effective means to ensure a permanent record of the mileage history of a motor vehicle, and by the development by the American Association of Motor Vehicle Administrators of model procedures for the disclosure of odometer information on vehicle titles. Such a record would be easily accessible to governmental enforcement agencies as well as prospective purchasers of used motor vehicles.

The notice of February 7, 1977, proposed to allow the use of a State document containing odometer disclosure information if the State document contained "all" of the information required on the Federal form. A comment from the Attorney General of Ohio pointed out that it would be difficult for States to include "all" of the odometer information on their titles because of the limited space available. Consequently, NHTSA has decided to revise § 580.4(f) to accommodate those States that provide odometer information on their titles by establishing a procedure under which States can have their titles approved for use as odometer disclosure statements. In view of the utility of titles and their limited space, the procedure would permit shortening the odometer provisions on the title where necessary. Although a shorter disclosure might sacrifice clarity to a degree, the agency regards this as an acceptable price for gaining the benefits of a combined title and odometer disclosure.

States that wish to have their certificates of title satisfy the Federal odometer disclosure requirements must meet the basic provisions of the Federal requirement, with the following exceptions:

(1) The citation to the Federal law may be deleted in favor of a reference to State law. The reference provisions could then state that "Federal and State regulations require you to state the odometer mileage upon transfer of ownership. (Citation to State law instead of Federal law)."



(2) The initial statement of the odometer reading and the following alternate certifications should be included on the title. States may, however, condense that information as long as none of the certifications are lost. An example of such condensation could be "I certify to the best of my knowledge that the odometer reading is ----- and reflects the actual mileage of the vehicle described herein or (check if applicable).

☐ 1. The amount of mileage stated is in excess of 99,999 miles, or

☐ 2. The odometer reading is not the actual mileage."

3. The transferee's signature must still appear on the title but it need not expressly indicate acknowledgement of receipt of the disclosures.

4. The certification that the odometer was either not altered or altered for repair or replacement purposes may be deleted.

All deviations on the certificate of title from the Federal requirements must be approved by the NHTSA prior to the use of State titles as substitutes for the Federal form. The exceptions noted above are to be used by the States only as guides in preparing conforming titles. In order for the citizens of a State to use the certificate of title as their odometer disclosure form, the Administrator of the State Department of Motor Vehicles must first request an exemption from the provision of the disclosure requirement by submitting such request in writing with a copy of the proposed certificate of title. The NHTSA will then notify the Administrator of its decision to accept or refuse the request and the reasons for its decision. Upon receipt of the NHTSA's acceptance of the request for an exemption, the State may proceed with a campaign to notify consumers, dealers and distributors of such acceptance. It shall be the State's responsibility to publicize that its title may be used in place of the odometer disclosure statement.

*Additional comments.* One commenter asked whether there would be specifications for size. There are none, with the understanding that all print should be legible to the naked eye. Another commenter suggested that section 580.4(c)(3) be changed to add the word "believed" so that the

reading would be "I hereby certify that to the best of my knowledge the odometer reading as stated above is believed NOT to be the actual mileage. . . ." NHTSA considers this addition unnecessary because the certification already states "to the best of my knowledge."

A commenter proposed that the form should be amended to say that the names and addresses of prior owners are available from a State agency. NHTSA has determined that this should not be added. The addresses are not available from some State agencies and such a provision would therefore be of limited utility. Another addition that was suggested was to add a reference to the minimum damages and attorneys fees available under the Federal law. This was proposed to alert consumers to the fact that certain impediments to enforcement, such as the expense of lawyers and proof of actual damages, are removed by the Act. These references, like any other additions desired by the States or transferors, may be added, but will not be required due to space limitations and to a determination that they are not necessary if there is sufficient publicity of the law.

An individual commented that the seller should be allowed to estimate the amount of mileage difference and explain the error. There is certainly no prohibition against a seller doing so, but NHTSA sees no benefit to be gained in requiring this. A buyer can, and certainly should, request such information, but anyone who has violated the Act will, nonetheless, not provide a truthful statement of the mileage difference or the reason for that difference. The result could be that a buyer is unknowingly led into reliance on this false statement, whereas an independent check of his own could have produced the truth.

It was suggested that positive introductory statements be used for the certification sections. The commenter noted that in its experience, when a positive introductory statement is lacking, the seller fails to check any box. Its proposal would modify the statement as follows: "I ----- state that the odometer now reads ----- miles and I hereby certify that to the best of my knowledge the odometer reading as stated above reflects the actual mileage of the vehicle



described below, unless one of the following statements is checked.

☐ (1) I hereby certify that the odometer reading reflects the amount of mileage in excess. . . ."

☐ (2) I hereby certify that to the best of my knowledge the odometer reading as stated above is NOT . . ."

The NHTSA has not experienced the failure to check a box when a positive introductory statement is lacking and consequently, will retain the statement in the proposed rule. Should it become evident that a positive introductory statement is needed, further rulemaking will be undertaken. It should be noted that the form suggested by this commenter would significantly shorten the length of this provision, thus it would be an acceptable alternative only where the odometer disclosure is on the certificate of title.

A suggestion was made to provide a notice that an auxiliary odometer had been used in the vehicle. The auxiliary odometer would interrupt the operation of the regular odometer and cause it to register less than the vehicle's actual mileage. The seller would therefore be required by the present language of the regulation to notify the buyer of the odometer error. In view of this, NHTSA considers it unnecessary to refer specifically to an auxiliary odometer.

It was also suggested that the owner of a vehicle be allowed to replace or adjust the odometer to reflect actual mileage. The commenter noted that occasionally odometers jump ahead 10, 20, or 30 thousand miles and if the odometer cannot be altered to read the actual mileage instead of the mileage on the odometer before repair or replacement, the trade-in value would be drastically decreased to the harm of the owner. NHTSA believes that the few cases in which the odometer malfunctions and rolls forward too fast are too slight to justify this provision. Such a provision would create a loophole for those who wanted to roll back their odometer and then claim that it

was rolling over too fast and they had to fix it by moving it backward. Anyone whose odometer did jump could replace or repair the odometer, set it to zero so that a buyer would not be misled by the odometer reading, and upon sale provide a statement to the buyer that the mileage is NOT actual and that the actual mileage is less than that shown on the odometer or on the repair or replacement sticker. More importantly, it should be noted that the repair and replacement provisions, wherein the owner is required to reset the odometer to the mileage before repair or replacement or to zero, are part of the Motor Vehicle Information and Cost Savings Act (section 407(a)). Consequently, they are not susceptible to change by NHTSA, but only by Congress.

Requests by commenters that odometer readings be required on registration forms, that statements be required to be retained, and that manufacturers be required to furnish 6 digit odometers are not applicable to this rulemaking action. It should be noted that a retention requirement for odometer disclosure statements will be issued soon and that a proposed rule requiring tamper-proof odometers which indicate when they have exceeded 100,000 miles or kilometers was issued on December 7, 1976. The proposed effective date of the latter rule is September 1, 1979.

In consideration of the foregoing, Part 580, Odometer Disclosure Requirements is amended. . .

The lawyer principally responsible for this rule is Kathleen DeMeter.

(Sec. 408, Pub. L. 92-513, 86 Stat. 962, as amended by Pub. L. 94-364, 90 Stat. 983 (15 U.S.C. 1988); delegation of authority at 49 CFR 501.8(i).)

Issued on July 25, 1977.

Joan Claybrook  
Administrator

**42 F.R. 38906-38908**  
**August 1, 1977**

## PREAMBLE TO PART 580—ODOMETER DISCLOSURE REQUIREMENTS

(Docket No. 77-06; Notice 2)

The Secretary of Transportation is authorized by the Motor Vehicle Information and Cost Savings Act to specify requirements for retention of odometer statements by dealers and distributors of motor vehicles. This notice prescribes the manner in which this information should be retained. The intended effect of this regulation is to afford the government and aggrieved parties documentation necessary to prove a violation of the Act, and to pinpoint exactly where the violation occurred.

Effective date: March 9, 1978.

For further information contact:

Kathleen DeMeter, Office of Chief Counsel,  
National Highway Traffic Safety Administration,  
400 Seventh Street, SW., Washington,  
D.C. 20590 (202-426-1834).

Supplementary information: The Motor Vehicle Information and Cost Savings Act (Pub. L. 92-513, 86 Stat. 947-963, 15 U.S.C. 1901-1999) directed the Secretary of Transportation to issue regulations to require each transferor of a motor vehicle to give the transferee a written statement of the mileage shown on the vehicle's odometer and to advise the transferee if the mileage shown on the odometer was known to be different from the vehicle's actual mileage. A regulation was issued pursuant to section 408 of the Act to prescribe the manner of disclosure (49 CFR Part 580), but the Secretary chose not to exercise the authority given him under subsection 408(a) to specify the manner in which such information was to be retained.

The 1976 amendments to the Act (Pub. L. 94-364, 90 Stat. 981) conferred extensive investigative powers upon the Secretary. One effect of these new powers is to enhance the value of a record retention requirement as an investigatory tool. The disclosure statement plays an impor-

tant role in the investigation of odometer tampering and fraud. In order to prove that an odometer has been rolled back or otherwise tampered with in violation of the Act, it must be possible to ascertain the amount of actual mileage the vehicle has been driven. An effective way of discovering this information is by examining previous odometer mileage statements required to be executed by all owners in the chain of title.

To enhance the ability of the statement to protect all future transferees a notice of proposed rulemaking (NPRM) was issued on November 1, 1977, which would not only require the dealers and distributors to retain for four years the statements issued to them but would also require them to retain for four years a copy of each statement which they issued. Such retentions would afford the government and aggrieved parties the necessary documentation to prove a violation of the Act, and also to pinpoint exactly where that violation occurred. All of the comments submitted in response to the NPRM have been considered and the most significant ones are discussed below.

The final rule is almost identical to the NPRM. The NPRM proposed that odometer mileage statements be retained in chronological order. The final rule permits mileage statements to be retained in an order appropriate to the business requirements of each dealer and distributor. A majority of commenters objected to the chronological order provision. A number of other methods of filing were suggested, such as by vehicle identification number and alphabetical order by the customer's last name. Due to the wide variety of methods of filing presently used, the NHTSA believes that a single mandated method of filing would result in unnecessary cost and duplication. Therefore, the new section permits dealers and distributors to retain odometer mileage statements in a manner consistent with their

existing recordkeeping procedures. The section requires that however the recordkeeping system is organized, it must permit a systematic retrieval of odometer statements.

One commenter suggested that a longer lead-time was necessary to accommodate changes in filing procedures. However, since recordkeeping requirements need not be changed, there should be no lead time problems.

Several commenters objected to the scope of the rule. There appeared to be some confusion among the commenters as to whether the rule applied to insurance companies, manufacturers and financial institutions. The final rule applies to all dealers and distributors of motor vehicles. A "dealer" is defined in section 402 of the Act as "any person who has sold 5 or more motor vehicles in the past 12 months to purchasers who in good faith purchase such vehicles for purposes other than resale." A "distributor" is defined in the same section as "any person who has sold 5 or more vehicles in the past 12 months for resale." Given these definitions, a manufacturer would be a "distributor." However, § 580.5 of Title 49, Code of Federal Regulations specifically exempt manufacturers who sell vehicles to dealers from the requirements of executing disclosure statements. Section 583.7 of this final rule has been reworded to make it clear that only those "dealers" and "distributors" who are required to execute disclosure statements must retain them. Financial institutions and insurance companies do

not fall within any of the exemptions set forth in § 580.5, so they must execute and retain the statements unless the transfers involve vehicles that are so badly damaged that they cannot be returned to the road. In such transfers, the agency has ruled that the damaged vehicles are no longer "motor vehicles" for purposes of the disclosure regulations.

In light of the foregoing, Part 580, Odometer Disclosure Requirements, of Title 49, Code of Federal Regulations, is amended as set forth below.

The lawyer principally responsible for this rule is Kathleen DeMeter.

The rule does not require any persons to create additional records or to alter their business practices apart from keeping records they might once have discarded. In view of the expected benefits to the Department's enforcement program, it is found for good cause that the rule may be issued with an immediate effective date.

(Secs. 408, 414, Pub. L. 92-513, 86 Stat. 947, as amended Pub. L. 94-364, 90 Stat. 981 (15 U.S.C. 1988, 1990(d)); delegation of authority at 49 CFR 1.50(f).).

Issued on March 7, 1978.

Joan Claybrook  
Administrator

**43 F.R. 10921-10922**  
**March 16, 1978**



## **PREAMBLE TO AMENDMENT TO PART 580—ODOMETER DISCLOSURE REQUIREMENTS**

**(Docket No. 77-06; Notice 4)**

**ACTION:** Final rule.

**SUMMARY:** This notice allows States to use an abbreviated odometer disclosure statement on all motor vehicle ownership documents. The existing regulation permitted the shortened form to be used merely on the certificate of title. The purpose of this expansion is to increase State usage of odometer disclosure statements.

**DATE:** The effective date is the date of publication in the Federal Register.

**FOR FURTHER INFORMATION CONTACT:**

Kathleen DeMeter, Office of Chief Counsel,  
National Highway Traffic Safety  
Administration, 400 Seventh Street, S.W.,  
Washington, D.C. 20590. (202-426-1834).

**SUPPLEMENTARY INFORMATION:** Section 408 of the Motor Vehicle Information and Cost Savings act (15 U.S.C. 1988) requires each transferor of a motor vehicle to provide to the transferee a written disclosure of the distance travelled by the vehicle. 49 CFR Part 580 prescribes the information to be included on the disclosure statement. On August 1, 1977, NHTSA amended the odometer disclosure statement (42 FR 38906). The amended statement is clearer than the former statement and less likely to be misused, but it is also longer.

NHTSA has urged the States to include the odometer statement on the title. Six States had included the original statement. In commenting on the longer statement, several States observed that the title, with its size limitations, presented more problems with inclusion of the odometer statement than did other documents relating to the transfer and ownership of motor vehicles. Because of this, the 1977 amendment specifically allowed a shortened form to be used on certificates of title, but not on other ownership documents.

On May 7, 1979, the NHTSA issued a notice of proposed rulemaking in which it granted a petition

by the American Association of Motor Vehicle Administrators (AAMVA) to amend the Federal odometer disclosure requirements to allow the abbreviated form to be used on ownership documents other than the certificate of title (44 FR 28032). The AAMVA emphasized that many of the State documents used to evidence ownership of motor vehicles are too small to accommodate the additional information required. They argued that States should not have to rely on separate odometer forms for these transfers but should be allowed to use the shortened form on all documents which evidence ownership, not only on the certificate of title.

Seven States responded to the notice of proposed rulemaking. Comments were received from the motor vehicle departments in Virginia, Washington, Delaware, Wisconsin, New Jersey, Texas, and Oregon. Most comments were favorable. The Virginia Division of Motor Vehicles asked that the short form be acceptable on all applications for title. The more State documents that contain mileage information the more difficult it will be for odometer rollbacks to go undetected. Consequently, the NHTSA encourages the use of the short form on applications for title as well as certificates of title.

Washington and Wisconsin suggested respectively that the introductory paragraph citing the Federal law be deleted or shortened due to document size limitations. The August 1, 1977, amendment to the disclosure form noted that a reference to State law may be substituted for the citation to the Federal law.

Consistent with this interpretation, it is the agency's opinion that the actual law need not be cited if a warning statement appears such as that suggested by Washington, "Warning False Statements Violate Federal Law."

The Texas State Department of Highways and Public Transportation offered the only negative comments to the proposal. It argued that a purchaser who finances a motor vehicle could not execute a form on the certificate of title at the time of sale because the certificate is held by a bank or financial institution as security. Although the Texas comment illustrates the difficulties of trying to require the use of titles for odometer disclosure, the amendment is permissive and would not require Texas to change its practices in any way.

In accordance with Executive Order 12044, the regulation has been reviewed for environmental and economic impacts. It has been determined that the cost of implementing this regulation will be minimal. There are no additional requirements.

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The regulation permits States to provide certain information on ownership documents but does not require them to do so. There are no environmental or other economic impacts, therefore, this regulation is not significant.

Issued on December 20, 1979.

Joan Claybrook  
Administrator, National  
Highway Traffic Safety  
Administration

**45 F.R. 784**  
**January 3, 1980**

## PART 580—ODOMETER DISCLOSURE REQUIREMENTS

(Docket No. 72-31; Notice 2)

### § 580.1 Scope.

This part prescribes rules requiring the transferor of a motor vehicle to make written disclosure to the transferee concerning the odometer mileage and its accuracy, and requiring the retention of odometer mileage statements by motor vehicle dealers and distributors, as directed by section 408(a) and 414(b) of the Motor Vehicle Information and Cost Savings Act, Pub. L. 92-513, as amended by Pub. L. 94-364.

### § 580.2 Purpose.

The purpose of this part is to provide each purchaser of a motor vehicle with odometer information to assist him in determining the vehicle's condition and value, and to preserve records that are needed for the proper investigation, and adjudication or other disposition, of possible violations of the Motor Vehicle Information and Cost Savings Act.

### § 580.3 Definitions.

All terms defined in Sections 2 and 402 of the Act are used in their statutory meaning. Other terms used in this part are defined as follows:

"Transferor" means any person who transfers his ownership in a motor vehicle by sale, gift, or any means other than by creation of a security interest.

"Transferee" means any person to whom the ownership in a motor vehicle is transferred by purchase, gift, or any means other than by creation of a security interest.

### § 580.4 Disclosure of odometer information.

(a) Before executing any transfer of ownership document, each transferor of a motor vehicle shall

furnish to the transferee a written statement signed by the transferor, containing the following information:

- (1) The odometer reading at the time of transfer;
- (2) The date of transfer;
- (3) The transferor's name and current address;
- (4) The transferee's name and current address; and
- (5) The identity of the vehicle, including its make, model, year, and body type, and its vehicle identification number.

(b) In addition to the information provided under paragraph (a) of this section, the statement shall refer to the Motor Vehicle Information and Cost Savings Act and shall state that incorrect information may result in civil liability and civil or criminal penalties.

(c) In addition to the information provided under paragraphs (a) and (b) of this section,

(1) The transferor shall certify that to the best of his knowledge the odometer reading reflects the actual miles or kilometers the vehicle has been driven; or

(2) If the transferor knows that the odometer reading reflects the amount of mileage in excess of the designed mechanical odometer limit of 99,999 miles/kilometers, he shall include a statement to that effect; or

(3) If the transferor knows that the odometer reading differs from the number of miles/kilometers the vehicle has actually traveled and that the difference is greater than that caused by odometer calibration error, he shall include a statement that the odometer reading is not the actual mileage, and should not be relied upon.



(d) In addition to the information provided under paragraphs (a), (b) and (c) of this section, the transferor shall certify that:

(1) The odometer was not altered, set back, or disconnected while in the transferor's possession, and he has no knowledge of anyone else doing so;

(2) The odometer was altered for repair or replacement purposes while in the transferor's possession, and the mileage registered on the repaired or replacement odometer was identical to that before such service; or

(3) The odometer was altered for repair or replacement purposes, the odometer was incapable of registering the same mileage, it was reset to zero, and the mileage on odometer before repair was \_\_\_\_\_ miles/kilometers.

(e) The transferee shall acknowledge receipt of the disclosure statement by signing it.

(f) (1) If the laws or regulations of the State in which the transfer occurs require the odometer disclosure to be made on the certificate of title or other State documents which evidences ownership, the transferor may make the disclosure required by this section by executing the State certificate of title or such other ownership document. In order to utilize the above documents as substitutes for the Federal odometer disclosure statement, they must contain essentially the same information required by paragraphs (a), (b), (c) and (e) of this section. If the information contained thereon varies in any way from that required for the Federal form, the State must obtain approval from the National Highway Traffic Safety Administration before its certificate of title or other ownership document can be used as a substitute for the Federal form. Such approval may be obtained by submitting a copy of the proposed document to the Office of the Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

(2) The NHTSA shall respond to the State's request within 30 days of receipt of such request.

(3) If a document, other than the certificate of title, provided under the laws or regulations of the State in which the transfer occurs contains all of the statements required by this section, the transferor may make the disclosure required by this section either by executing the State document or by executing the disclosure form specified in § 580.6.

(g) If there is no State document as described in paragraph (f) of this section, the transferor shall make the disclosure required by this section by executing the disclosure form specified in § 580.6.

#### **§ 580.5 Exemptions.**

Notwithstanding the requirements of § 580.4—

(a) A transferor of any of the following motor vehicles need not disclose the vehicle's odometer mileage:

(1) A vehicle having a Gross Vehicle Weight Rating, as defined in § 570.3 of this title, or more than 16,000 pounds;

(2) A vehicle that is not self-propelled; or

(3) A vehicle that is 25 years old or older.

(b) A transferor of a new vehicle prior to its first transfer for purposes other than resale need not disclose the vehicle's odometer mileage.

#### **§ 580.6 Disclosure form.**

##### **ODOMETER MILEAGE STATEMENT**

(Federal regulations require you to state the odometer mileage upon transfer of ownership. An inaccurate or untruthful statement may make you liable for damages to your transferee, for attorney fees, and for civil or criminal penalties, pursuant to sections 409, 412, and 413 of the Motor Vehicle Information and Cost Savings Act of 1972 (Pub. L. 92-513, as amended by Pub. L. 94-364).

I, \_\_\_\_\_ state that the  
(transferor's name, Print)  
odometer of the vehicle described below now  
reads \_\_\_\_\_ miles/kilometers.

☐ (1) I hereby certify that to the best of my knowledge the odometer reading as stated above reflects the actual mileage of the vehicle described below.

☐ (2) I hereby certify that to the best of my knowledge the odometer reading as stated above reflects the amount of mileage in excess of designed mechanical odometer limit of 99,999 miles/kilometers of the vehicle described below.

- ☐ (3) I hereby certify that to the best of my knowledge the odometer reading as stated above is NOT the actual mileage of the vehicle described below, and should not be relied upon.

Make	Model	Body type
Vehicle identification number		Year

Check one box only.

- ☐ (1) I hereby certify that the odometer of said vehicle was not altered, set back, or disconnected while in my possession, and I have no knowledge of anyone else doing so.
- ☐ (2) I hereby certify that the odometer was altered for repair or replacement purposes while in my possession, and that the mileage registered on the repaired or replacement odometer was identical to that before such service.
- ☐ (3) I hereby certify that the repaired or replacement odometer was incapable of registering the same mileage, that it was reset to zero, and that the mileage on the original odometer or the odometer before repair was \_\_\_\_\_ miles.

Transferor's Address (seller) \_\_\_\_\_  
(Street)

\_\_\_\_\_  
(City) (State) (ZIP Code)

Transferor's Signature (seller) \_\_\_\_\_

Date of Statement \_\_\_\_\_

Transferee's Name and Address (buyer) \_\_\_\_\_

\_\_\_\_\_  
(Street)

\_\_\_\_\_  
(City) (State) (ZIP Code)

Receipt of copy Acknowledged \_\_\_\_\_

\_\_\_\_\_  
(Transferee's signature, buyer)

#### § 580.7 Odometer mileage statement retention.

Each dealer or distributor of a motor vehicle who is required by this Part to execute an odometer disclosure statement shall retain for four years each odometer mileage statement which he receives. He shall also retain for four years a photostat, carbon, or other facsimile copy of each odometer mileage statement which he issues. He shall retain each odometer mileage statement at his primary place of business in an order that is appropriate to this business requirements and that permits systematic retrieval. The statement may be reproduced (e.g., photocopies or put on microfilm) as long as no information or identifying marks such as signatures are lost in the reproduction.

**38 F.R. 2978**  
**January 31, 1973**





## PREAMBLE TO PART 581—BUMPER STANDARD

(Docket No. 74-11; Notice 12; Docket No. 73-19; Notice 9)

This notice establishes a new bumper standard, limiting damage to vehicle bumpers and other vehicle surfaces in low-speed crashes.

The standard, 49 CFR Part 581, is issued under the authority of Title I of the Motor Vehicle Information and Cost Savings Act, Public Law 92-513, 15 U.S.C. 1901-1991. In addition to specifying limitations on damage to non-safety-related components and vehicle surface areas, it also incorporates the safety requirements currently contained in Federal Motor Vehicle Safety Standard No. 215, *Exterior Protection*.

Since the enactment of the Motor Vehicle Information and Cost Savings Act, the NHTSA has issued four proposals to establish a front and rear end damage ability standard that fulfills the objectives espoused in the law. Title I (*Bumper Standards*) directs the NHTSA to develop standards which "shall seek to obtain the maximum feasible reduction of costs to the public and to the consumer. . . ." Improving the damage resistance of a vehicle in low-speed impact situations will, in the opinion of Congress, save the consumer a significant amount of money.

During the past several years of ongoing rule-making in the bumper area, the NHTSA has continued to conduct studies and examine input from all interested persons. The most recent proposal was published March 12 of this year (40 FR 11598). After thoroughly reviewing the available data and comments submitted to the docket, the NHTSA has concluded that the provisions contained in the March notice would constitute a large step towards accomplishment of the goals described in Title I.

On January 2, 1975, the NHTSA proposed a reduction in the impact speeds specified in Standard 215 and proposed in Part 581 (40 FR 10). The NHTSA's proposal was based primarily on

the results of two agency-sponsored studies which indicated that the cost and weight of many current production bumpers, in light of inflation and fuel shortages, made the bumpers no longer cost-beneficial. Information presented at public hearings on the notice and comments submitted to the docket brought to light additional data which the NHTSA carefully examined. After reviewing its previous studies in light of this new evidence, the agency concluded that the 5-mph protection level (and the 3-mph corner impact level associated with it) should not be reduced. In its March 12, 1975, notice (40 FR 11598) the NHTSA fully explained this decision. Comments have been received from Toyo Kogyo, Volkswagen, Nissan, Motor Vehicle Manufacturers Association, Chrysler, General Motors, Toyota, and Gulf & Western urging the NHTSA to reconsider its rejection of the lower impact test speeds proposed in January.

For the reasons discussed in the March *Federal Register* notice the NHTSA has determined that the pendulum and barrier impact speeds should not be reduced and should remain at 5 mph.

General Motors (GM) submitted two documents, dated January 9, 1976, and January 15, 1976, which analyzed the costs and benefits of 1974 bumper systems based on field surveys conducted in Fort Wayne, Indiana and Milford, Michigan. The conclusion reached by GM in these studies was that the 1974 model year bumper systems were not cost-beneficial. They requested, based on the result of this study, that any raising of the current bumper standard requirements be delayed until longer-term benefit-cost analyses are made.

The NHTSA has examined this study and has concluded that the proposed Part 581 damage-ability standard, which will upgrade the bumper requirements, should be implemented in accord-

ance with the time schedule set forth in this notice. GM in its study has chosen to analyze the cost-effectiveness of bumper systems designed solely for safety component protection. The costs considered by GM have been those occasioned not only by damage to safety-related components, but to non-safety-related vehicle areas, as well. While it may be true that a bumper system that is designed primarily for safety component protection will also provide some degree of protection against non-safety-related damage, it is unreasonable to evaluate the cost-effectiveness of such a system on its capability to perform outside its primary design function. A bumper system designed to comply with Title I would necessarily provide protection to both safety and non-safety-related components and would thereby reduce the degree of damage suffered by most 1974 model vehicles involved in front and rear impacts. The cost-effectiveness of a Title I system, thus, cannot be realistically measured by an examination of 1974 systems which have been designed to provide a lower level of damage protection.

GM gathered data only on its own 1974 model cars and concluded that the impact of Standard 215 on all vehicles has not been cost-beneficial. Conclusions based on such limited data, however, are not sufficient reason for suspending further rulemaking to improve the damage protection capabilities of bumpers. As explained in the March 12, 1975, notice, considerable data have been presented indicating that the bumper systems on some current-model automobiles are heavier and costlier than necessary. This unnecessary weight not only adds to the initial costs, but also increases the life-time operating costs of the vehicle. The use of such bumpers, it has been concluded, has been the result of unnecessary design choices by motor vehicle manufacturers. Studies conducted by the NHTSA and Houdaille Industries, Inc., a bumper manufacturer, indicate that bumper systems utilizing current technology and designed to meet the Part 581 damageability requirements need not weigh any more than pre-standard-215 bumper systems. Basing future rulemaking on the results of a cost-benefit analysis utilizing bumper systems that have not been optimized would be unreasonable.

In the March 12, 1975, notice, the NHTSA proposed alternative effective dates for implementation of the initial Part 581 test requirements. The applicable requirements call for restricted surface damage except to components that actually contact the impact ridge of the pendulum test device or that fasten such components to the vehicle chassis frame. Commenters were asked to address the feasibility of satisfying the proposed damage criteria by September 1, 1976, September 1, 1977, or September 1, 1978. Chrysler said it could meet the prescribed damage level by September 1, 1976, but only if certain modifications in the test requirements were made. Volvo also stated that it could comply by September 1976, but warned of a significant cost penalty. Toyo Kogyo and British Leyland stated they could meet a September 1, 1977 effective date. Toyo Kogyo, however, commented that this would occasion high development costs. British Leyland, on the other hand, said that it could satisfy an earlier effective date, but only at significant cost. American Motors, Ford, and Toyota urged a September 1, 1978, effective date saying that amount of lead time was necessary to obtain compliance.

The Insurance Institute for Highway Safety, the National Association of Independent Insurers, and State Farm urged a 1976 effective date citing the need for regulation of damage to vehicle components and surface areas aside from those directly related to safety. The Insurance Institute supported its request for a 1976 effective date by stating that many existing cars are substantially able to meet the initial Part 581 requirements.

In the NHTSA's view, adoption of a 1976 or 1977 effective date would impose serious lead time problems on a number of manufacturers. Based upon information submitted by the automobile industry, bringing vehicles into compliance by September 1, 1976 or 1977, if possible at all, would entail the expenditure of large sums of money for redesign and retooling. A September 1, 1978 effective date would assure satisfactory compliance with the Part 581 requirements and would avoid the high costs that would occur as a result of an earlier effective date.

The NHTSA has, therefore, concluded that a September 1, 1978, effective date should be



adopted for implementation of the initial Part 581 damageability requirements. This amount of lead time appears necessary for all manufacturers to come into conformity with the provisions.

Toyo Kogyo, American Motors, Motor Vehicle Manufacturers Association, Chrysler, and Ford urged a delay in the proposed September 1, 1979 effective date for implementation of the "no damage" bumper requirements. Toyo Kogyo requested a 1983 effective date, while the other manufacturers suggested that no upgraded requirements be scheduled until field data have been gathered indicating the success of the interim requirements. The National Association of Independent Insurers, anxious for early implementation of the full range of bumper performance requirements, supported adoption of the proposed 1979 effective date.

The NHTSA has examined all of these comments and has concluded that the September 1, 1979 effective date should be adopted. This would provide a lead time of approximately 4 years, which appears sufficient to bring the vehicles into compliance. Awaiting the results of field data related to the interim requirements is not practicable. The information currently before the agency indicates that the proposed 1979 surface damage limitation is a substantial step towards achieving the level of bumper efficiency described by Congress in the Cost Savings Act. Waiting for the accumulation and analysis of additional information would unnecessarily and unreasonably delay the implementation of Part 581, a standard the agency is directed by law to promulgate.

The NHTSA has proposed in several past notices the adoption of test requirements that would allow the manufacture of vehicles with soft exterior surfaces. Currently, the Standard No. 215 exterior protection standard prohibits contact with Planes A and B of the pendulum test device since those areas represent parts of the vehicle that house safety components such as headlamps. Most vehicles constructed with soft exterior surfaces would not be able to comply with the Standard No. 215 requirements since by their very nature they would yield to the impact of the pendulum. The quality of soft face bumper systems which is not taken into account

by the Planes A and B prohibition is that such systems can be constructed in a manner that assures return of the system to its original contours following an impact. The NHTSA proposal would permit contact with the planes at limited force and pressure levels. These force and pressure limitations were intended to assure that the bumper system would yield in a collision to a degree that would minimize damage to the other vehicle's components.

Comments to the proposal to allow contact with Planes A and B focused on that provision's test conditions and its specification of pressure limitations. According to commenters, the prescribed instrumentation of Planes A and B is not practicable since it would be costly with allegedly unreliable test results.

British Leyland, Renault, and Peugeot wanted the agency to clarify the rule by specifying that no instrumentation is necessary on the pendulum where there is no contact during testing with Planes A and B. This fact should be clear based on prior interpretations given by the NHTSA. It has been stated many times in the past that a manufacturer need only exercise due care in assuring that his vehicle would comply with the requirement of a standard when tested by the NHTSA in the manner prescribed. The manufacturer need not conduct the tests prescribed in the standard in order to satisfy this duty. Depending upon the circumstances there may be other means by which he can certify his vehicles' compliance. In the case at issue, the instrumented pendulum would only serve to assure that impact with the planes would not exceed the stated maximum levels. If there is no contact with these planes then obviously the instrumentation would serve no purpose.

Volvo suggested that the provision permitting Planes A and B contact not be added to the standard until a measuring device can be better defined. American Motors, however, presented a suggestion that it contended would significantly simplify the test procedure without diminishing the desired level of vehicle protection. It suggested that the 200-psi limitation be deleted and that a force limitation of 2000 pounds on the combined surfaces of Planes A and B above the impact ridge and 2000 pounds total force on Plane A below the impact ridge be adopted.



American Motors stated that the 200-psi specification was unnecessary in light of the damage limitations contained in the standard.

The initial Part 581 damage criteria [proposed to go into effect September 1, 1976, or 1977, or 1978 (made effective by this notice for September 1, 1978)] presented some problems for Volkswagen, American Motors, Chrysler, Volvo, and Ford with respect to the areas in which damage would be permissible. The proposed section (S5.3.8) limits change to surface areas and safety components, but permits damage to the bumper face bar. The manufacturers argued that damage should also be permitted to cosmetic filler panels, bumper guards, nerf strips, license plate brackets, stone shields, and other components which are not specifically part of the vehicle body. The support for this position is that these components appear to be included in the proposal's description of items that would not be subject to damage limitation during the interim period.

The relevant language of S5.3.8 states that vehicles shall have no damage except to the bumper face bar and the components and associated fasteners that directly attach the bumper face bar to the chassis frame. The bumper face bar is defined as any component of the bumper system that contacts the impact ridge of the pendulum test device. Stone shields and cosmetic filler panels would not be excepted from the damage criteria unless they directly attach the bumper face bar to the chassis frame. Based upon the information currently before the agency, it has determined that neither stone shields nor filler panels are intended to serve such a function.

Bumper guards and nerf strips which are located in a position where they are contacted by the impact ridge of the test device would be considered as a bumper face bar with the lateral metal component (commonly known as a bumper) considered as a component that directly attaches the bumper face bar to the vehicle chassis frame. This reasoning would also apply to bumper systems that have a layer of plastic, rubber, or some other material covering the underlying load bearing structure. The covering material would be considered the bumper face bar and the underlying structure would be considered a component that attaches the face bar to the chassis frame.

Toyo Kogyo commented that the damage criteria contained in S5.3.8 would necessitate the addition of 13 pounds to the bumper which would change the emission rank of some cars and thereby increase their fuel consumption from 4 to 8 percent. The cost of counteracting the increased fuel consumption would, according to Toyo Kogyo, range from \$100 to \$200 per car.

The additional lead time allowed by the September 1, 1978 date for implementation of the initial damage criteria should enable Toyo Kogyo to concentrate its efforts on minimizing any increase in the weight of complying vehicles.

State Farm expressed concern over the application of the S5.3.8 damage criteria to vehicles with soft face systems. They asserted that allowing damage to the bumper face bar and associated components would, in the case of soft face bumper systems, permit damage to the entire front and rear end of the vehicle. This could occur since some soft-face construction utilizes a single large component in the front and rear of the vehicle that takes on the appearance of the vehicle body, but by definition would be the bumper face bar. It was State Farm's suggestion that damage be permitted only to those portions of the bumper face bar that actually come in contact with the impact ridge of the pendulum test device. This would in their opinion avoid the possibility of widespread damage to areas not actually contacted.

The NHTSA finds State Farm's concern unfounded. The 2000-pound total force limitation to the combined surfaces of Planes A and B of the pendulum test device will have the effect of preventing any substantial damage to the areas mentioned by State Farm. For this reason, the NHTSA denies State Farm's request to revise the language of S5.3.8.

Ford Motor Company criticized the provision prohibiting breakage or release of fasteners or joints (S5.3.9) as unreasonable. It asserted that efficient production requires keeping to a minimum the efforts involved in installing moldings and insignia. Of importance, in their opinion, is assuring that the moldings and insignia resist "popping" on rough roads and during minor parking lot impacts. However, they assert that the performance level that would be achieved by

S5.3.9 is unreasonably high since, in their view, moldings which pop off can be easily reinstalled with minimal cost and inconvenience to the car owner.

The NHTSA disagrees with Ford's argument. To allow the type of damage described by Ford would be partially to defeat the effectiveness of the standard. Ornaments that fall off and trim strips that pop off must be repaired if the value of the vehicle is to be maintained. The time and money invested by an individual who must obtain such a repair following a relatively minor collision can be avoided if the manufacturer is required to comply with the performance level of S5.3.9. The NHTSA disagrees with Ford's assessment of the time, cost, and effort involved in obtaining such repairs. The agency has therefore determined that to carry out the Congressional intent to reduce the cost of low-speed accidents, it must require ornaments and trim strips to be immune from damage under the test conditions of the standard.

There were numerous comments on the damageability requirements proposed to go into effect on September 1, 1979. Many of the manufacturers suggested a change in the maximum dent limitation (S5.3.11) and requested that a certain amount of bumper set be allowed. In its March 12 notice, the NHTSA proposed to limit damage to the bumper face bar to permanent dents no greater than  $\frac{3}{8}$  inch from the original contour. The proposed  $\frac{3}{8}$ -inch deviation was based on a Louis Harris & Associates survey of public reactions to bumper damage at various depths. This survey was commissioned by Houdaille Industries, Inc., a manufacturer of bumpers.

International Nickel Co. and Toyota requested that the provision be revised to allow a  $\frac{3}{4}$ -inch deviation from the original bumper contour. In light of the results of the Harris survey, which indicated that consumers did not consider damage to be significant until the dents reached a depth of  $\frac{1}{4}$  to  $\frac{1}{2}$  inch, the NHTSA denies their request and adopts the proposed  $\frac{3}{8}$ -inch limitation. To allow deviations to a depth of  $\frac{3}{4}$  inch would be to disregard the results of the survey by permitting damage which would be considered significant by many consumers. This would undercut achievement of the purpose of the Part

581 bumper standard to reduce consumer loss of time and money.

Toyo Kogyo, American Motors, International Nickel, and Houdaille urged that the provision (S5.3.11) be amended to permit a certain degree of bumper set. It was pointed out that the impact to a bumper during testing can result in two types of contour change, dent and set. Bumper set is an overall movement or flattening of the bumper face bar which when minor is rarely detectable by the unaided human eye. Under the currently proposed provision the  $\frac{3}{8}$ -inch deviation limitation would apply to both setting and denting, with the total of these two types of deviations limited to  $\frac{3}{8}$  inch. Thus, the permissible degree of dent deviation would actually be less than  $\frac{3}{8}$  inch. Compliance with such a requirement would, according to commenters, result in the production of heavier and more costly bumper systems.

Since the NHTSA has based its  $\frac{3}{8}$ -inch deviation limitation on consumer reaction to a dent of that depth, it agrees with commenters that a certain degree of bumper set could be permitted in addition to dent without visibly altering the level of allowable bumper damage. Minor set is generally imperceptible. Thus, allowing it to occur during impact tests would not significantly reduce the level of performance currently assured in the proposed provision. The NHTSA hereby amends Part 581 to permit  $\frac{3}{4}$  inch of bumper set in addition to dents of  $\frac{3}{8}$  inch.

Consumers Union asserted that the NHTSA should not require near-zero level of damage on all cars since such a regulation would prevent manufacturers from offering as an option cars with cheap, lightweight, expendable bumpers which meet the standard's other requirements. The NHTSA finds no merit in this suggestion and for the following reasons denies the request. First of all, to make compliance with the "no damage" provisions optional would be to disregard the mandate of Congress in the Cost Savings Act, which instructs the agency to promulgate a standard that will reduce consumer costs occasioned by bumper damage. Second, cars produced with lower performance bumpers would be less expensive than those meeting the Part 581 criteria. They might, therefore, seem more appealing to consumers who are unaware



of the costly damage that might be incurred during low-speed collisions. The purpose of Title I of the Cost Savings Act is to protect consumers from such an eventuality. Third, mass production is the factor that will keep manufacturing costs at a low level. If only some vehicles are constructed with damage-resistant bumpers, the cost of those vehicles is likely to be higher than necessary because of this factor.

Nationwide Mutual Insurance Co. and the National Association of Independent Insurers expressed concern that the  $\frac{3}{8}$ -inch deviation limitation was too lenient. Nationwide felt that the  $\frac{3}{8}$ -inch deviation constituted a relaxation of the NHTSA's previous position that only a dimple should be allowed to the bumper. The NHTSA has concluded, based on the Harris survey, that a dent  $\frac{3}{8}$  inch in depth would be inconsequential to most car owners. Prescribing such a deviation as the maximum allowable in a 5-mph barrier or pendulum impact is, therefore, in keeping with the goal of reducing economic loss occasioned by low-speed collisions.

The National Association of Independent Insurers suggested that the  $\frac{3}{8}$ -inch deviation be upgraded to require that the dent extend over a minimum area in a dishing fashion which would be less noticeable. This suggestion is rejected since the  $\frac{3}{8}$ -inch provision has been fully supported as providing a damage level that fulfills the goals of Title I. In addition, prescribing a dishing effect as a necessary element for compliance would not take into account the various types of impacts to which a vehicle is subject.

State Farm urged that the prohibition against separations of surface materials, paint, polymeric coatings, or other materials from the surface to which they are bonded be extended to cover the bumper face bar during barrier impact tests. Under the current proposal these surface damage limitations would apply only to parts of the vehicle other than the bumper face bar. State Farm asserted that the limitation of application of the no-surface-damage requirements to vehicle surfaces other than the bumper face bar was intended to accommodate the pendulum impact. They therefore see no justification for applying the same limitation during barrier impact testing.

The NHTSA denies State Farm's request. While both barrier and pendulum impacts can cause some chipping or flaking of chrome or soft-face material (depending upon the type of system being tested), such damage is insignificant. Application of a no-surface-damage requirement to the bumper face bar would probably result in manufacturers having to upgrade their plating process or use more sophisticated covering materials to assure compliance. This could result in significant cost increases with little, if any, increase in benefits.

Both State Farm and British Leyland requested that S7.1.1 of Part 581 be clarified to indicate that the pendulum impacts from 16 and 20 inches are intended to be inclusive. Since compliance with the pendulum impact requirements at any height between 16 and 20 inches would necessitate meeting the damage criteria at heights infinitesimally close to 16 and 20 inches, the clarification requested by these commenters is insubstantial. The NHTSA, however, amends S7.1.1 to include the 16- and 20-inch heights as subject to the damage criteria, since some persons apparently considered it unclear.

Chrysler requested a modification of the Part 581 longitudinal pendulum impact test to specify that the required pendulum impacts be at least 12 inches apart laterally and 1 inch apart vertically from any prior impact. The request is denied, since such a modification would prohibit more than one hit in the same area of the bumper. Under the current Part 581 proposal, an impact within 12 inches laterally must be separated from any prior impact by 2 inches, vertically. Based upon available accident data, the NHTSA has concluded that a vehicle will be involved in an average of approximately 2 to 3 bumper collisions at speeds of 5 mph or less in its 10-year life. On an individual vehicle basis, the distribution or the area of the bumper affected by these impacts cannot be predicted. In order to assure a performance level that corresponds with real-world conditions, the NHTSA has determined that each bumper must be capable of meeting the prescribed damage criteria when subjected to more than one pendulum impact in the same area of the bumper.

A substantial number of comments were received from individuals concerned that the Part



581 bumper standard might in some way limit the recycling of bumpers in the aftermarket. This concern is unfounded, since the requirements contained in Part 581 ensure that a wide variety of materials can continue to be used in bumper systems. The provisions in no way restrict the use of metals in bumper systems.

Chrysler argued that the pendulum test device should be used only as a means of assuring uniform bumper height. In its opinion, the pendulum impact test does not constitute an appropriate means of evaluating bumper damageability since the pendulum is rigid, heavy, and aggressive.

The NHTSA does not find Chrysler's argument meritorious. To delete the pendulum impact test as a means of establishing bumper damageability resistance would be to lower considerably the proposed level of performance currently contained in Part 581. The pendulum impact requirements assure that a vehicle is capable of involvement in various types of low-speed collisions without sustaining significant damage. They impose localized stresses at various points on the bumper face bar while the barrier impacts only establish a vehicle's overall ability to withstand impacts at specified energy levels, assuring

the basic strength of the front and rear bumper. In order to satisfy its Congressional mandate by reducing the economic loss occasioned by low-speed collision damage, the NHTSA has concluded that the Part 581 bumper standard must prescribe test requirements that measure a vehicle's damageability characteristics in both barrier and pendulum-type stress situations.

In light of the foregoing, Title 49, Code of Federal Regulations, is amended . . . .

1. Federal Motor Vehicle Safety Standard No. 215, *Exterior Protection* (49 CFR 571.215), is revoked.

2. A new Part 581, *Bumper Standard*, is added to read as set forth below.

*Effective date:* September 1, 1978.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); sec. 102, Pub. L. 92-513, 86 Stat. 947 (15 U.S.C. 1912) delegation of authority at 49 CFR 1.51.)

Issued on February 27, 1976.

James B. Gregory,  
Administrator, National Highway  
Traffic Safety Administration

**41 F.R. 9346**

**March 4, 1976**



## PREAMBLE TO AMENDMENT TO PART 581—BUMPER STANDARD

(Docket No. 74-11; Notice 17; Docket No. 73-19; Notice 14)

This notice responds to petitions for reconsideration of the March 4, 1976, Federal Register notice (41 FR 9346) establishing a new bumper standard that limits damage to vehicle bumpers and other vehicle surfaces in low-speed crashes.

Effective Date: September 1, 1978.

Address: Petitions should be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

For Further Information Contact:

Tim Hoyt, Office of Crashworthiness,  
Motor Vehicle Programs,  
National Highway Traffic Safety Administration,  
Washington, D.C. 20590 (202-426-2264).

Supplementary Information:

The standard, 49 CFR Part 581, issued under the authority of Title I of the Motor Vehicle Information and Cost Savings Act, Public Law 92-513, 15 U.S.C. 1901-1991, limits damage to non-safety related components and vehicle surfaces and incorporates the safety-related damage criteria of the current Standard No. 215, *Exterior Protection* (49 CFR Part 571.215). Under the new standard, all vehicles manufactured on or after September 1, 1978, must be capable of undergoing prescribed pendulum and barrier crash tests while experiencing damage only to the vehicle bumper and those components that attach it to the vehicle frame. Vehicles manufactured on or after September 1, 1979, must be capable of undergoing the same tests while experiencing no damage to vehicle exterior surfaces except on the bumper, where dents not exceeding  $\frac{3}{8}$  inch and set not exceeding  $\frac{3}{4}$  inch may occur.

Petitions for reconsideration were received from General Motors (GM), Ford, Chrysler, American Motors Corporation (AMC), Gulf &

Western, Nissan, and Leyland Cars. The issues raised by petitioners focused primarily on Part 581's cost-benefit basis, its leadtime, and its damage criteria.

GM, Ford, Chrysler, AMC, Nissan, and Gulf & Western stated that the National Highway Traffic Safety Administration (NHTSA) failed to present evidence that Part 581 would be cost beneficial. Ford stated that the record supporting Part 581 gives no assurance that the public will realize incremental savings once the standard is implemented. Chrysler, Nissan, and Gulf & Western cited cost and weight increases which they alleged would impose additional burdens on car owners over and above those presently experienced. AMC complained that the provision for escalating the bumper requirements after one year would result in costly and complex bumper designs, since such a schedule would prohibit the optimization of bumper systems.

Petitioners requested that the agency demonstrate that the requirements of Part 581 will provide cost savings greater than those currently provided by Standard No. 215, *Exterior Protection*. It was suggested by GM, AMC, and Ford that the agency undertake field studies to gather data to support the Part 581 standard. Several manufacturers suggested that implementation of Part 581 be postponed until such time as a field study is completed.

Petitioners' arguments have been raised in past comments to Federal Register notices proposing a Part 581 bumper standard. The NHTSA found them unpersuasive then and hereby rejects them once again. The NHTSA and Houdaille Industries conducted cost benefit studies on compliance with the Part 581 bumper requirements. The studies indicate that bumper systems using current technology and designed to meet the standard's requirements will provide a favorable



cost-benefit ratio. Petitioners have not presented evidence that effectively disputes the conclusions reached in these studies.

Conducting field studies as a means of gathering evidence to support implementation of the Part 581 standard is unrealistic and would not demonstrate as accurately as the Houdaille and NHTSA studies the positive cost-saving potential of the standard. Many manufacturers are continuing to comply with the current Standard 215 bumper requirements by means of inefficient, unoptimized bumpers. Data gathered on these systems thus would not indicate the full possibilities of bumpers specifically designed to meet the Part 581 requirements in an efficient manner. Once manufacturers start utilizing the technology and materials available to them the full benefits of the Part 581 bumper standard can be realized. Until such time, however, manufacturers have it within their power to cause field study results to be misleading and unrepresentative of the potential of Part 581.

The NHTSA has ample evidence in the record that manufacturers are capable of meeting the requirements of Part 581. It also has evidence that compliance can be achieved in a cost-efficient manner. There has been no evidence presented by any of the petitioners that the standard would have a negative cost-benefit impact if met in the ways outlined by Houdaille and the NHTSA in their studies. The agency therefore rejects the cost-benefit objections raised by petitioners.

AMC requested additional leadtime to meet the requirements of Part 581. It contended that it needs 36 months' leadtime to comply with Part 581. It asked that the initial effective date of the standard be delayed until September 1, 1979.

The NHTSA finds AMC's request without merit. The 30-month leadtime for the initial requirements and the 42-month leadtime for the final requirements is considered adequate for compliance. No other manufacturers have expressed concern over attaining the level of performance prescribed for 1978, and evidence in the record indicates that most vehicles already come close to satisfying the specified damage criteria. The request of AMC is therefore denied.

General Motors objected in its petition to the prescribed escalation of the bumper requirements

for September 1, 1979, only 1 year after the standard's initial effective date. It stated that compliance with two sets of bumper requirements within such short period of time would result in unrecoverable costs relating to research, design, development, and tooling, and would inhibit the feasibility of optimizing its bumper systems.

Ford Motor Company stated that it plans to redesign its passenger cars for 1981 due to the requirements of the Energy Policy and Conservation Act (Pub. L. 94-163) and associated legislation. Ford explained that compliance with Part 581 will entail some redesign. It therefore requested that the bumper standard's effective date be delayed until September 1, 1980, so that these necessary redesigning efforts can be accomplished simultaneously.

The agency has found both General Motors' and Ford's requests persuasive. It has therefore issued a notice proposing to delay for 1 year the implementation of the second phase of bumper requirements from September 1, 1979, until September 1, 1980. This action does not conform exactly to Ford's request. However, the NHTSA does not know of any vehicles that would require major design changes until implementation of the more stringent second phase requirements.

Filler panels and stone shields were identified in the March 4, 1976, final rule as exterior vehicle surfaces that must experience no damage as a result of the prescribed test impacts. GM, Chrysler, and AMC objected to this interpretation of the level of damage resistibility filler panels and stone shields must achieve. GM contended that these components are part of the bumper system and provide the transition between the bumper face bar and body panels. It stated that bumper stroke causes unavoidable surface scratches, abrasions, and displacements, which could be eliminated only by using expensive materials and mounting techniques. Chrysler pointed out that filler panels are designed to flex during bumper impacts and may not return to exactly their original contour. According to AMC, however, once a deformed bumper is repaired following an impact, the flexible filler panel will return to its original contour. All three manufacturers requested that filler panels be permitted to sustain some degree of damage during testing.

The agency has reexamined the role of filler panels and stone shields in the bumper system and finds that although they do not actually hold the bumper to the vehicle frame, they are cosmetic components that are part of the entire system that performs the task of attaching the bumper to the frame of the car.

The NHTSA has concluded that permitting damage to filler panels and stone shields will not significantly degrade the level of performance required for vehicles manufactured after September 1, 1978. The flexibility of the filler panel and stone shield material enables it to withstand deforming impacts without permanently losing its shape, but as long as the bumper and components attaching it to the vehicle frame are permitted to sustain damage as a result of impacts, the filler panel and stone shield may likewise sustain some degree of damage. Since these components are less visible than the bumper itself, the small amount of damage that they will incur will normally not be as significant as that allowed to the bumper. Therefore, filler panels and stone shields on vehicles manufactured from September 1, 1978, to August 31, 1979, will be permitted to sustain damage during the prescribed test impacts. This, in essence, grants the requests of petitioners. The agency will address in an upcoming notice the application of damage criteria to stone shields and filler panels on vehicles manufactured after September 1, 1979.

Ford and Chrysler charged that the Part 581 damage criteria are impracticable and lacking in objectivity. Specifically, they objected to the criteria that allow no separations or deviations, and require certain systems to operate in a normal manner. According to petitioners, these criteria are not objective since the requirements of no separation and no deviations can be interpreted as meaning that even the most microscopic deviations and separations are prohibited, or alternatively that only those deviations that are readily apparent are prohibited. With regard to the requirement that certain systems operate in a normal manner, petitioners stated that the meaning of "normal" is unclear and can be interpreted differently by different people. Ford and Chrysler expressed concern that the agency will

interpret the meaning of these damage criteria in a manner conflicting with their interpretation. To resolve the situation to which it is objecting, Chrysler suggested that the requirements be revised to allow minimal and inconsequential deviations, while Ford suggested that the agency withdraw S5.3.2 and S5.3.5 and parts of S5.3.3, S5.3.8, S5.3.10, and S5.3.11 pending development of objective criteria to enable manufacturers to predict accurately whether their vehicles will comply.

The agency understands the petitioners' concerns, but finds that a simple interpretation of the cited requirements is adequate to satisfy their objections. The damage criteria allowing no deviations and no separations are not intended to apply to microscopic changes in the vehicle following test impacts. The types of deviations and separations addressed by Part 581 are those that are perceptible without the use of sophisticated magnifying or measuring equipment. What is required is that the vehicle not reflect any normally observable changes in the stated areas following the prescribed test procedure. Damage that is only identifiable by use of microscopically-oriented equipment would not be considered as prohibited under Part 581.

With regard to the requirement that a vehicle's hood, trunk, and doors operate in the normal manner, the standard is simply providing that these systems continue to operate following the test impacts in the same manner as they did before the impacts. This requirement has been a part of Standard No. 215, *Exterior Protection*, since its implementation on September 1, 1972. No compliance controversies have ever arisen concerning it.

Leyland Cars and AMC requested that the requirements of S5.3.11, allowing no more than  $\frac{3}{4}$ -inch set and  $\frac{3}{8}$ -inch dent to the bumper face bar, be made applicable to the component that backs up the bumper face bar. Leyland Cars explained that some of its bumpers are covered by a rubber or plastic molding which, under Part 581, would be considered as the bumper face bar. It requested that the component over which the molding is placed be permitted to sustain the same degree of set allowed for the bumper face bar. AMC asked that the component underly-



ing the molding be permitted to experience dents up to  $\frac{3}{8}$ -inch as is the bumper face bar.

The NHTSA finds petitioners' concerns unfounded. The prohibition against set and denting applies to vehicle exterior surfaces. From the description of the component supplied by Ford and Chrysler it appears that it is completely covered by the molding and is not an exterior surface area of the vehicle. Therefore, it may experience damage during test impacts. The molding enveloping the reinforcement would represent the exterior surface that is subject to the requirements of S5.3.11.

Nissan and Gulf & Western objected to the prescribed limitations on set and denting contained in S5.3.11. Nissan requested that the damage criteria be revised to allow  $\frac{1}{2}$ -inch dent and 1-inch set, instead of the currently required  $\frac{3}{8}$ -inch dent and  $\frac{3}{4}$ -inch set. It was Nissan's contention that such a revision would cause only a slight change in the appearance of a damaged vehicle, while enabling a considerable change in a vehicle's cost and weight. Gulf & Western alleged that there was no economic justification for the  $\frac{3}{8}$ -inch dent and  $\frac{3}{4}$ -inch set requirements since they are based solely upon a public opinion poll. It requested that the Part 581 requirements not be implemented until an economic justification is presented.

The NHTSA finds both Nissan's and Gulf & Western's requests lacking in merit. A survey conducted by Louis Harris & Associates of public reaction to various degrees of bumper damage showed that a significant number of people consider  $\frac{1}{2}$ -inch dents to be damage they would repair. Based upon this information and cost and weight data contained in the various studies upon which the agency relied in the formulation of the standard, it has been determined that the amendment requested by Nissan would adversely affect the results to be achieved by implementation of the Part 581 bumper standard. The results of the Harris survey have definite economic significance in that those individuals indicating that a certain degree of damage was significant enough that they would have it repaired were providing the pollster with cost data. Damage that is repaired will have a financial impact on the car owner. By the same token,

damage that is detectable and thereby have an economic impact on the car owner. These cost factors were all considered in deciding on the  $\frac{3}{8}$ - and  $\frac{3}{4}$ -inch damage limitations. For these reasons, the requests of Nissan and Gulf & Western are denied.

Chrysler objected to the procedure prescribed for measuring the depth of bumper dents (S5.3.11(b)), charging that it is unreasonable, inaccurate, and lacks objectivity. Chrysler alleged that the end points of the straight line described in the test procedure for connecting the bumper contours adjoining the contact area are locations that are subjective on bumper face bars with compound curvature. It also charged that the specified measurement method lacks objectivity and can be used only for determining the depth of dents in flat surfaces. Chrysler requested that the agency clarify the provision.

Although the objections raised by Chrysler illustrate that some configurations are more difficult to measure than others, it is the agency's judgement that the method described in S5.3.11(b) is valid and still the most feasible means of determining the extent of damage. Location of the end points of the straight line used to measure the depth of bumper dents does not, in the opinion of the NHTSA, pose a problem. In order to establish the exact location of the end points, the manufacturer may either paint or chalk the pendulum test device. In this way, the pendulum will leave a mark on the precise area of contact.

With regard to Chrysler's objections concerning the measurement of dents, it should be noted that the straight line measurement technique is not necessarily a test procedure. Rather, the language specifying that a deviation from original contour not exceed  $\frac{3}{8}$ -inch when measured from a straight line connecting the bumper contour adjoining the contact area should be considered a definition of a dent. Deformations outside the contact area on the bumper surface, such as recessions of a larger area of the bumper, are defined as set.

The agency realizes that the measurement of dent and set on some bumpers with complex curvature may not be a simple procedure. In such cases, the testers must use measurement pro-



cedures that will enable them to accurately measure the degree of dent the bumper has incurred. In situations involving a concave face bar, a reference line can be established by placing a straight line across the area of contact prior to impact. After completion of the actual impact the change in bumper contour can be measured from the previously established reference line. In situations involving a convex face bar, or more complex surfaces, it may be necessary for the manufacturer to remove the bumper following impact in order to compare it with an unimpacted bumper, or to make a cast of the preimpact bumper for comparison with the bumper for comparison with the bumper following the prescribed testing.

Chrysler also requested that S5.3.11 be amended to specify that bumper set be measured relative to the vehicle frame in perpendicular, parallel, and vertical directions with respect to the vehicle's longitudinal centerline. It stated that such a revision would reduce the task of measuring permanent set to a reasonable level.

The NHTSA denies this request since Chrysler has presented no information indicating that the currently prescribed measurement procedure is unfeasible. The agency knows of no reason why reference lines relative to the vehicle frame cannot be established from which bumper set can be measured. To adopt Chrysler's suggested method for measurement would unduly complicate the procedure since determination of the vehicle longitudinal centerline is complex.

GM charged that the NHTSA's definition of bumper face bar may include license plate brackets that are attached to the vehicle bumper, since these components may contact the impact ridge of the pendulum test device. If identified as the bumper face bar, these license plate brackets would be required to meet the level of performance prescribed for bumpers. According to GM, such a result would be extremely costly. License plate brackets capable of complying with the bumper damage criteria would be expensive to produce as well as to replace. This, in GM's opinion, would have a negative cost-benefit impact.

While the NHTSA agrees that license plate brackets should not be required to meet the dam-

age criteria of the bumper face, the NHTSA believes that it is good design practice to locate license plates in an area other than the bumper face. However, recognizing the limited space available on the front of some cars for license plate placement, the NHTSA is reluctantly willing to grant GM's petition on this point. The agency will, in the future, review industry practice on the placement of license plates on new automobiles in an effort to determine if future rulemaking on this matter would be desirable.

AMC requested in its petition that the NHTSA amend the requirements limiting the total force on planes A and B to 2,000 pounds (S5.3.7) to permit a force of 2,000 pounds on plane A below the impact ridge and a force of 2,000 pounds on the combined surfaces of planes A and B above the impact ridge. AMC based its request on the premise that the current requirement allows the full 2,000-pound force to be exerted either above or below the impact ridge of the test device. It pointed out that the NHTSA stated in an earlier notice that the 2,000-pound limit would prevent any substantial damage to the vehicle. Based upon this, AMC argued that allowing 2,000 pounds of force both above and below the impact ridge would not expose those surface areas to any greater force than would be allowed under the current requirements.

The NHTSA disagrees with AMC's contention. The force limitation contained in Part 581 is intended to assure that the primary force of the impact is directed at the bumper face bar. Although all 2,000 pounds of allowable force could be directed to the area either above or below the impact ridge, this total amount of force would not be a significant damage factor. However, if the areas covered by planes A and B were allowed to sustain a total force of 4,000 pounds, the focus of primary force on the bumper face bar would not be assured and the type of aggressive bumper system Part 581 is designed to prevent could be utilized. AMC's request is therefore denied.

AMC requested that Part 581 be amended to include a provision appearing in the January 2, 1975, proposal (40 FR 10) that stated a vehicle need not meet further requirements after having

been subjected to either the longitudinal pendulum impacts followed by the barrier impacts, or the corner pendulum impacts.

The agency has stated in past notices that a vehicle will be involved in an average of three low-speed collisions in its 10-year life. There is no way to predict which portion of the bumper will be affected in these impacts. Therefore, it was decided that vehicles should be required to meet the prescribed damage criteria when subjected to the entire series of test impacts. To provide otherwise would be to establish a level of performance lower than necessary to protect a vehicle from the full range of potentially damaging impacts it is likely to incur during its on-road life. It was for this reason that the provision appearing in the January 2, 1975, proposal was not adopted. It is for this same reason that the agency denies AMC's request.

The text of the Title I bumper standard has in previous notices and the March 4, 1976, final rule been published in the format of a motor vehicle safety standard. Since the bumper standard is actually an entire part within Chapter V

of the Code of Federal Regulations, the format must be changed in order that it may be properly codified. The content of the standard will remain the same. This notice, however, revises the numbering system so that it conforms to the Code of Federal Regulations format.

The principal authors of this notice are Guy Hunter, Office of Crashworthiness, and Karen Dyson, Office of Chief Counsel.

In light of the foregoing, 49 CFR Part 581, is amended and recodified. . . .

*Effective date:* September 1, 1978.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); sec. 102, Pub. L. 92-513, 86 Stat. 947 (15 U.S.C. 1912); delegation of authority at 49 CFR 1.50.)

Issued on May 4, 1977.

Joan Claybrook  
Administrator

**42 F.R. 24056**  
**May 12, 1977**

## PREAMBLE TO AMENDMENT TO PART 581—BUMPER STANDARD

(Docket No. 73-19; Notice 19 & Docket No. 74-11; Notice 22)

This notice corrects an inadvertent error in the notice that changed the format of Part 581, *Bumper Standard*, so that its numbering system conformed to the Code of Federal Regulations format (42 FR 24056; May 12, 1977). In that notice, the new numbering was not totally incorporated into the body of the regulation.

For further information contact:

Mr. Tim Hoyt  
Office of Crashworthiness  
Motor Vehicle Programs  
National Highway Traffic Safety  
Administration  
Washington, D.C. 20590  
202-426-2264

Supplemental information: On May 12, 1977, the National Highway Traffic Safety Administration published a Federal Register notice (42 FR 24056; FR Doc. 77-13235) responding to petitions for reconsideration of the March 4, 1976, notice (41 FR 9346) establishing a new bumper standard. The May notice also changed the format of Part 581. The text of the bumper standard was previously published in the format of a motor vehicle safety standard. Since the standard is actually an entire part within Chap-

ter V of the Code of Federal Regulations its numbering system was revised in order that it could be properly codified.

When Part 581 was published with its revised format, only the section headings were properly renumbered. The texts of the various sections were inadvertently left unchanged. This notice revises the section references in the body of the regulation to conform to the new format.

The principal author of this notice is Karen Dyson, Office of Chief Counsel.

In accordance with the foregoing, changes should be made to 49 CFR Part 581, *Bumper Standard*. . . .

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); sec. 102, Pub. L. 92-513, 86 Stat. 947 (15 U.S.C. 1912); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on July 26, 1977.

Robert L. Carter  
Associate Administrator  
Motor Vehicle Programs

**42 F.R. 38909**  
**August 1, 1977**





## PREAMBLE TO PART 581—BUMPER STANDARD

(Docket No. 73-19; Notice 24)

This notice responds to a request from Ford Motor Company for further interpretation of the bumper damageability requirements of Part 581, *Bumper Standard*, and announces the photographic procedure NHTSA will use as an aid in determining whether damage to filler panels and stone shields (shielding panels) is normally observable for purposes of compliance with the standard. This interpretation assists manufacturers in ascertaining whether contemplated bumper designs will provide a level of performance consistent with the requirements of Part 581. This notice also corrects an inadvertent error in the previously announced effective dates for Phase I of the bumper requirements.

**Date:** This interpretation and the correction to Part 581 are effective immediately.

**For further information contact:**

Mr. Richard Hipolit, Office of Chief Counsel,  
400 Seventh Street, S.W., Washington, D.C.  
20590 (202-426-9512)

**Supplementary information:** NHTSA has established, through issuance of Part 581, Bumper Standard (49 CFR Part 581), requirements for the impact resistance of vehicles in low speed collisions. The effective dates of Part 581 are September 1, 1978, for components other than the bumper face bar and certain associated fasteners (Phase I), and September 1, 1979 for all vehicle components (Phase II). On May 15, 1978, the agency published a notice (43 FR 20804) summarizing its interpretation of various aspects of the Part 581 damage resistance requirements as they relate to vehicle exterior surfaces. Ford Motor Company has asked for additional clarification of the requirement of paragraphs 581.5(c)(10) and (11) of the standard, in a June 22, 1978, request for interpretation that has been placed in the public docket.

### APPLICATION OF THE DAMAGE CRITERIA TO BUMPER FACE BARS AND ATTACHED COMPONENTS

The Phase II requirements prohibit permanent deviations from the original contours of vehicle exterior surfaces following pendulum and barrier impacts. An exception is made for the "bumper face bar," whose surface is permitted  $\frac{3}{4}$ -inch deviation from its original contour and position relative to the vehicle frame (set) and a  $\frac{3}{8}$ -inch deviation from its original contour on areas of contact with the barrier face or the impact ridge of the pendulum test device (dent) (§ 581.(c)(11)). Bumper face bar is defined in § 581.4 as "any component of the bumper system that contacts the impact ridge of the pendulum test device." NHTSA has stated that this definition includes components of a multipiece bumper which are connected as part of the same load bearing structure to a bumper system component which is contacted either by the pendulum test device or the test barrier (43 F.R. 20804; May 15, 1978).

Ford has inquired as to the applicability of this definition of bumper face bar to a variety of components such as directional signals and shielding panels, which may be mounted to a load bearing structure while themselves performing no structural function. Components which do not perform a load bearing function are not necessarily components of the bumper system (and potentially bumper face bar) solely as the result of their incidental mounting on or near a load bearing structure of the bumper system. Components must be examined on a case-by-case basis to determine whether they constitute components of the bumper system.

The agency stated in a previous notice that shielding panels are considered a component of

the bumper system and thus will qualify as bumper face bar if contacted in testing (43 F.R. 20804; May 15, 1978). The same would be true of other cosmetic components directly associated with the bumper system's function such as manufacturing cut-out patches and tape strips the primary function of which is to hide protrusions, primary function of which is to hide protrusions, fasteners, or other unsightly aspects of the

Illumination devices, e.g., fog lamps and directional signals, are not associated with the bumper system's function and could not qualify as components of the bumper system, even if contacted by the pendulum test device or barrier.

Still other components could be considered components of the bumper system, depending on their application in a particular vehicle design. For example, a grille, which would generally be associated with the vehicle body, could perform a protective function as a component of a bumper system in a soft-face configuration, and could therefore qualify as a component of the bumper system.

The agency recognizes that components mounted to a bumper face bar, but not themselves considered face bar because they are not part of the bumper system or are not impacted in testing, will necessarily move with the set of the bumper face bar, although they do not qualify for the permissible  $\frac{3}{4}$ -inch set allowance of (c) (11) (i). However, the stricter damage limitations of paragraph 581.5(c)(10), applicable to such components, are actually limited to "normally observable changes in the started area following the prescribed test procedures" (42 F.R. 24058; May 12, 1977). "[M]ovement of small patches covering manufacturing process cut-outs on the face bar" and movement of shielding panels with the set of the bumper are not considered normally observable (43 F.R. 20804; May 15, 1978). Similarly, non-bumper (e.g., fog-lamps) and other bumper system components (e.g., tape strips), attached to or built into a bumper face bar but not contactable by the test device, would not be considered to have normally observable damage when they simply move with

the set of the face bar. Such movement would, however, be normally observable if the function of the mounted component were impaired, e.g., by misalignment, in the case of a fog lamp beam, to the extent that it would not be adjustable to its normal aim.

The thin, polymeric tape strips described above typically are adhesively bonded to the surface areas of the bumper face bar. The impact of the pendulum test device or test barrier with the bumper face bar may cause distortions on portions of the face bar not directly impacted during testing and cause localized separation on these tape strips from the face bar surface, in the form of wrinkling or bubbling.

The agency had previously stated that, "while both barrier and pendulum impacts can cause some chipping or flaking of chrome or soft-face material (depending on the type of system being tested), such damage is significant" (41 F.R. 9346; March 4, 1976). This reasoning also governs minor damage to tape strips, such as wrinkling or bubbling, so long as the strips are contactable and thus qualify as bumper face bar. This interpretation would apply equally whether the damage happened to fall at the area of impact or elsewhere on the face bar.

Any component of the bumper system which can be contacted by the impact ridge of the pendulum test device in any permissible pendulum stroke is considered bumper face bar for testing of that bumper system, whether or not it was actually contacted in a particular test sequence. Further, the interpretation concerning non-contactable but load bearing components of multipiece bumpers discussed above, although originally announced in the context of metal bumpers (43 F.R. 20804; May 15, 1978), would also govern a multipiece bumper assembly equipped with plastic or rubber bumper guards or nerf strips. Thus, all load bearing components of the bumper assembly, whether plastic, rubber, or metal would be considered bumper face bar and be entitled to a  $\frac{3}{4}$ -inch set if they are connected as a part of the same load bearing structure.



## MEASUREMENT OF DAMAGE TO THE BUMPER FACE BAR

Paragraph 581.5(c)(11) provides:

Thirty minutes after completion of each pendulum and barrier impact test, the bumper face bar shall have—

(i) No permanent deviation greater than  $\frac{3}{4}$  inch from its original contour and position relative to the vehicle frame; and

(ii) No permanent deviation greater than  $\frac{3}{8}$  inch from its original contour on areas of contact with the barrier face or the impact ridge of the pendulum test device measured from a straight line connecting the bumper contours adjoining any such contact area.

Ford has inquired as to the measurement techniques the agency will use in determining compliance with these damage limitations. NHTSA has previously recognized that "the measurement of dent and set on some bumpers with complex curvature may not be a simple procedure" (42 F.R. 24056; May 12, 1977). In many cases there may be more than one procedure by which damage can be accurately measured. Innovations in measurement techniques may be needed as new bumper designs are developed. Therefore, while the agency can express the basic measurement geometry (which appears to be Ford's basic concern) that establish compliance with the damage limits, it cannot specify a particular method to be used in measuring those distances in all cases.

Ford requested resolution of the inadvertent inconsistency between agency statements in the May 1978 interpretation that "the two types of deviation are additive in an area of contact with the barrier face or impact ridge" but that "the localized deviation permitted by paragraph (ii) is measured taking any contour in the area of impact and measuring its movement from its location prior-to-impact to post-impact." The first statement accurately represents that the deviations are additive in the area of contact with the barrier or pendulum. The second statement failed to make the different and intended point that the contour of the contact area is measured from the contour previous to contact, but only after movement of the surface position and contour relative to the vehicle frame attributable to

set has been subtracted. It should be noted that contour change attributable to set must result from a generalized flattening of the bumper surface outside the area of contact. Otherwise the concept of dent would be indistinguishable from contour set.

The agency rejects Ford's suggestion to merely measure the contour in the contact area in relation to the surrounding contour following impact. The best example of why the original contour must serve as the baseline is the case in which the contact area consisted of a  $\frac{3}{8}$ -inch protrusion from the surrounding area prior to impact and a  $\frac{3}{8}$ -inch depression in relationship to the surrounding contour following impact. The resulting dent would actually be  $\frac{3}{4}$ -inch deep.

Ford further recommended that all dent measurements be made in vertical sections of the plane of impact which produced the dent. Recognizing the need for flexibility in the measurement of complex bumper configurations, Ford has withdrawn this portion of its request for interpretation.

Ford has questioned the portion of NHTSA's previous interpretation (43 F.R. 20804; May 15, 1978) which stated that dent may be measured "along any dimension, i.e., width, length, depth," from any line connecting the adjacent bumper contours. The agency has decided that the  $\frac{3}{8}$ -inch dent limitation of § 581.5(c)(11)(ii) should presently be limited to depth measurements only. Development of the Phase II face-bar contour requirements and studies which formed the basis for the  $\frac{3}{8}$ -inch dent requirements during the rulemaking proceeding focused primarily on limitation of the depth of deviations. A  $\frac{3}{8}$ -inch dent limitation measured in any direction might, at this time, impose an unanticipated burden in some cases and perhaps restrict the flexibility of manufacturers in selecting bumper systems for different model sizes which provide a suitable balance among the interrelated considerations of damage resistance, weight reduction, and cost. Should future testing and bumper design developments indicate that further face-bar dent limitations would be beneficial, such a requirement will be the subject of a future rulemaking notice.

Finally, Ford has asked whether there can be more than one contact area for purposes of measuring damage resulting from a particular impact. It is clear that multiple areas of contact between the bumper face bar and the impact ridge or test barrier may exist, thus creating multiple areas in which dent may occur. Given the complexity of some bumper designs, it would be unrealistic and impractical to require that all damage incurred in an impact be combined for measurement purposes. Deviations caused by impact at non-contiguous locations on the bumper system will be treated as separate contact areas, and damage in each of these areas will be measured separately, without reference to any other area of contact.

#### PHOTOGRAPHIC PROCEDURES TO AID IN EVALUATING DAMAGE TO SHIELDING PANELS

NHTSA's previous interpretation of the Part 581 requirements (43 F.R. 20804; May 15, 1978) addressed the problem of judging damage to vehicle shielding panels for purposes of determining compliance with paragraph 581.5(c)(10). That provision addresses all exterior surfaces other than bumper face bar and prohibits permanent deviation from original contours or separation of materials from the surface to which they are bonded. The interpretation reiterated that the agency does not consider damage to shielding components to be in violation of the standard if that damage is not "normally observable." In the case of shielding panels, damage not visible in good quality, photographic prints of the suspect area would not be considered by the agency to be "normally observable." The notice indicated that the Office of Vehicle Safety Compliance (OVSC), formerly the Office of Standards Enforcement, would establish standard procedures by which NHTSA would take its evaluative photographs.

While NHTSA originally stated that 8 by 10 inch photographic prints would be employed, the agency has concluded that the use of contact prints of that size may present practical difficulties due to the limited availability and unwieldiness of large cameras. Further study of

existing photographs indicates that 4 by 5 inch contact prints are adequate for the agency's testing.

Upon completion of impact tests in accordance with the test procedures of paragraph 581.7, OVSC photographs shielding panel areas that may have experienced permanent deviation or separation of materials.

*View Camera.* OVSC uses a standard 4 by 5 inch View Camera with focal length of 127 mm, a maximum aperture of f/4.7, a coated lens, and available shutter speeds of 1 second to 1/400 second.

*Film.* OVSC uses type 52 Pola Pan 4 by 5 inch film for Polaroid prints.

*Illumination.* OVSC takes the photographs indoors using the following illumination procedures: (1) illuminating the area to be photographed with crosslighting using two 1,000-watt photofloods lamp for main light, and one 1,000-watt photoflood lamp for fill-in light; and (2) positioning the photoflood lamps so that the light rays strike the subject area at a 45° angle from a distance of 10 feet from the area being photographed.

*Camera position.* OVSC positions the camera at a distance of 6 feet from the center of the suspect area and utilizes ground glass focusing to properly focus the camera for that distance. Photographs are taken both at 90° and 45° angles relative to the suspect area.

*Exposure.* OVSC utilizes a General Electric, DeJur or Weston photoelectric exposure meter to determine the exposure requirements. Light readings are taken by measuring the intensity of reflected light from a Kodak Gray Card placed upon the area to be photographed. The meter is placed near enough to the subject (gray card) to indicate the average reflected light (at least within a distance equal to the width of the subject being photographed). A light reading is obtained and set opposite the film speed which is indicated on the meter so that the f/stop or the aperture settings and shutter speeds coincide. The correct camera setting is read directly from the meter.

*Photographic print.* OVSC produces 4 by 5 inch black and white photographic contact prints from the Polaroid film.

*Examination of contact print.* OVSC examines the completed contact print with the unaided eye for compliance with 581.5(c)(10).

#### CORRECTION OF PHASE I EFFECTIVE DATES

On May 12, 1977, NHTSA published a *Federal Register* notice (42 F.R. 24056) responding to petitions for reconsideration and revising the format of Part 581 as originally announced on March 4, 1976 (41 F.R. 9346). Those notices inadvertently indicated that the Phase I exterior surface requirements, now contained in paragraph 581.5(c)(8), would apply to vehicles manufactured from September 1, 1978 to August 1, 1979. The requirements of paragraph 581.5(c)(8) actually

apply to vehicles manufactured until August 31, 1979, and the regulation is therefore corrected to reflect the intended effective dates.

In consideration of the foregoing, the date "August 1, 1979," contained in 49 CFR § 581.5(c)(8), is hereby corrected to read "August 31, 1979."

The program official and lawyer principally responsible for this document are Nelson Gordy and Richard Hipolit, respectively.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); sec. 102, Pub. L. 92-513, 86 Stat. 947 (15 U.S.C. 1912); delegation of authority at 49 CFR 1.50).

Joan Claybrook  
Administrator

**43 F.R. 40229-40232**  
**September 11, 1978**





## PART 581—BUMPER STANDARD

(Docket No. 74-11; Notice 12; Docket No. 73-19; Notice 9)

**§ 581.1 Scope.** This standard establishes requirements for the impact resistance of vehicles in low speed front and rear collisions.

**§ 581.2 Purpose.** The purpose of this standard is to reduce physical damage to the front and rear ends of a passenger motor vehicle from low speed collisions.

**§ 581.3 Application.** This standard applies to passenger motor vehicles other than multipurpose passenger vehicles.

**§ 581.4 Definitions.** All terms defined in the Motor Vehicle Information and Cost Savings Act, P.L. 92-513, 15 U.S.C. 1901-1991, are used as defined therein.

“Bumper face bar” means any component of the bumper system that contacts the impact ridge of the pendulum test device.

### **§ 581.5 Requirements.**

(a) *Vehicles manufactured on or after September 1, 1978.* Each vehicle manufactured on or after September 1, 1978, shall meet the damage criteria of § 581.5(c)(1) through § 581.5(c)(9) when impacted by a pendulum-type test device in accordance with the procedures of § 581.7(b) under the conditions of § 581.6, at an impact speed of 3 mph, and when impacted by a pendulum-type test device in accordance with the procedures of § 581.7(a) at 5 mph, followed by impacts into a fixed collision barrier that is perpendicular to the line of travel of the vehicle, while traveling longitudinally forward, then longitudinally rearward, under the conditions of § 581.6, at 5 mph.

(b) *Vehicles manufactured on or after September 1, 1979.* Each vehicle manufactured on or after September 1, 1979, shall meet the damage criteria of § 581.5(c)(1) through § 581.5(c)(7),

and § 581.5(c)(9) through § 581.5(c)(11), when tested in accordance with the requirements of § 581.5(a).

(c) Protective criteria.

(1) Each lamp or reflective device except license plate lamps shall be free of cracks and shall comply with applicable visibility requirements of S4.3.1.1 of Standard No. 108 (§ 571.108 of this part). The aim of each headlamp shall be adjustable to within the beam aim inspection limits specified in Table 2 of SAE Recommended Practice J599b, July 1970, measured with a mechanical aimer conforming to the requirements of SAE Standard J602a, July 1970.

(2) The vehicle's hood, trunk, and doors shall operate in the normal manner.

(3) The vehicle's fuel and cooling systems shall have no leaks or constricted fluid passages and all sealing devices and caps shall operate in the normal manner.

(4) The vehicles' exhaust system shall have no leaks or constrictions.

(5) The vehicle's propulsion, suspension, steering, and braking systems shall remain in adjustment and shall operate in the normal manner.

(6) A pressure vessel used to absorb impact energy in an exterior protection system by the accumulation of gas pressure or hydraulic pressure shall not suffer loss of gas or fluid accompanied by separation of fragments from the vessel.

(7) The vehicle shall not touch the test device, except on the impact ridge shown in Figures 1 and 2, with a force that exceeds 2000 pounds on the combined surfaces of Planes A and B of the test device.

tions of surface materials, paint, polymeric coatings, or other materials from the surface to which they are bonded, and no permanent deviations from their original contours 30 minutes after completion of each pendulum and barrier impact.

(11) Thirty minutes after completion of each pendulum and barrier impact test, the bumper face bar shall have—

(i) No permanent deviation greater than  $\frac{3}{4}$  inch from its original contour and position relative to the vehicle frame; and

(ii) No permanent deviation greater than  $\frac{3}{8}$  inch from its original contour on areas of contact with the barrier face or the impact ridge of the pendulum test device measured from a straight line connecting the bumper contours adjoining any such contact area.

**§ 581.6 Conditions.** The vehicle shall meet the requirements of § 581.5 under the following conditions:

(a) General.

(1) The vehicle is at unloaded vehicle weight.

(2) The front wheels are in the straight ahead position.

(3) Tires are inflated to the vehicle manufacturer's recommended pressure for the specified loading condition.

(4) Brakes are disengaged and the transmission is in neutral.

(5) Trailer hitches are removed from the vehicle.

(b) *Pendulum test conditions.* The following conditions apply to the pendulum test procedures of § 581.7(a) and § 581.7(b):

(1) The test device consists of a block with one side contoured as specified in Figure 1 and Figure 2 with the impact ridge made of A1S1 4130 steel hardened to 34 Rockwell "C." The impact ridge and the surfaces in Planes A and B of the test device are finished with a surface roughness of 32 as specified by SAE Recommended Practice J449A, June 1963. From the point of release of the device until the onset of rebound, the pendulum suspension system holds Plane A vertical, with the arc described by any point on the impact line lying in a vertical plane

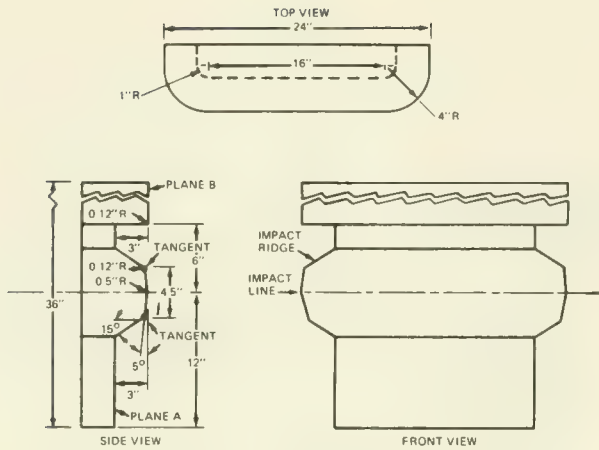


FIGURE 1

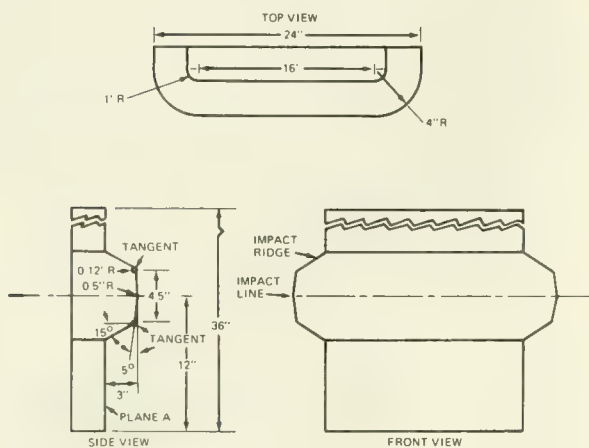


FIGURE 2

(8) For vehicles manufactured from September 1, 1978 to August 31, 1979, the exterior surfaces shall have no separations of surface materials, paint, polymeric coatings, or other covering materials from the surface to which they are bonded, and no permanent deviations from their original contours 30 minutes after completion of each pendulum and barrier impact, except where such damage occurs to the bumper face bar and the components and associated fasteners that directly attach the bumper face bar to the chassis frame.

(9) Except as provided in § 581.5(c) (8), there shall be no breakage or release of fasteners or joints.

(10) For vehicles manufactured on or after September 1, 1979, the exterior surfaces, except for the bumper face bar, shall have no separa-



(for § 581.7(a), longitudinal; for § 581.7(b), at an angle of 30° to a vertical longitudinal plane) and having a constant radius of not less than 11 feet.

(2) With Plane A vertical, the impact line shown in Figures 1 and 2 is horizontal at the same height as the test device's center of percussion.

(3) The effective impacting mass of the test device is equal to the mass of the tested vehicle.

(4) When impacted by the test device, the vehicle is at rest on a level rigid concrete surface.

(c) Barrier Test Condition. At the onset of a barrier impact, the vehicle's engine is operating at idling speed in accordance with the manufacturer's specification. Vehicle systems that are not necessary to the movement of the vehicle are not operating during impact.

#### **§ 581.7 Test Procedures.**

##### **(a) Longitudinal Impact Test Procedures.**

(1) Impact the vehicle's front surface and its rear surface two times each with the impact line at any height from 16 to 20 inches, inclusive, in accordance with the following procedure.

(2) For impacts at a height of 20 inches, place the test device shown in Figure 1 so that Plane A is vertical and the impact line is horizontal at the specified height.

(3) For impacts at a height between 20 inches and 16 inches, place the test device shown in Figure 2 so that Plane A is vertical and the impact line is horizontal at a height within the range.

(4) For each impact, position the test device so that the impact line is at least 2 inches apart in vertical direction from its position in any prior impact, unless the midpoint of the impact line with respect to the vehicle is to be more than 12 inches apart laterally from its position in any prior impact.

(5) For each impact, align the vehicle so that it touches, but does not move, the test device, with the vehicle's longitudinal centerline perpendicular to the plane that includes Plane A of the test device and with the test device in-board of the vehicle corner test positions specified in § 581.7(b).

(6) Move the test device away from the vehicle, then release it to impact the vehicle.

(7) Perform the impacts at intervals of not less than 30 minutes.

##### **(b) Corner impact test procedure.**

(1) Impact a front corner and a rear corner of the vehicle once each with the impact line at a height of 20 inches and impact the other front corner and the other rear corner once each with the impact line at any height from 16 to 20 inches, inclusive, in accordance with the following procedure.

(2) For an impact at a height of 20 inches, place the test device shown in Figure 1 so that Plane A is vertical and the impact line is horizontal at the specified height.

(3) For an impact at a height between 16 inches and 20 inches, place the test device shown in Figure 2 so that Plane A is vertical and the impact line is horizontal at a height within the range.

(4) Align the vehicle so that a vehicle corner touches, but does not move, the lateral center of the test device with Plane A of the test device forming an angle of 60 degrees with a vertical longitudinal plane.

(5) Move the test device away from the vehicle, then release it to impact the vehicle.

(6) Perform the impacts at intervals of not less than 30 minutes.

**41 F.R. 9346  
March 4, 1976**



**PREAMBLE TO PART 582—INSURANCE COST INFORMATION REGULATION****(Docket 74-40; Notice 2)**

This notice establishes an insurance cost information regulation pursuant to the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 *et seq.*). The regulation is based upon a notice of proposed rulemaking published November 4, 1974 (39 F.R. 38912) and comments submitted in response to the notice.

The regulation will require automobile dealers to distribute to prospective purchasers information which compares differences in insurance costs for different makes and models of passenger motor vehicles based upon differences in their damage susceptibility and crashworthiness. In the absence of insurance cost information that reflects damageability and crashworthiness, this rule does not, at the present time, have an effect on automobile dealers. Damage susceptibility and crashworthiness studies currently being conducted by the NHTSA are expected to influence the insurance rate structure by providing data which will enable the insurance industry to take these factors into account. As this occurs, the NHTSA will prepare comparative indices for the dealers to distribute to prospective purchasers.

Several comments on the proposed rulemaking discussed the merits of the Motor Vehicle Information and Cost Savings Act and are therefore beyond the scope of this rulemaking. Other comments offered methods for performing the damage susceptibility and crashworthiness studies. These comments have been forwarded to the technical staff performing the studies. Two comments suggested minor changes in the text of the regulation for clarity and to make the proposed regulation more consistent with the purposes of the Act. These suggestions have been adopted

in the final regulation. Their effect is that the insurance cost information disseminated by the dealers would be in the form of comparative indices, based on differences in damage susceptibility and crashworthiness, rather than simply the insurance premium rate which is determined by many factors.

One comment expressed the view that providing this information to consumers within 30 days after its publication in the *Federal Register* was an excessive burden upon the dealers. The NHTSA does not believe that sufficient justification for this position has been made in light of the need to provide the information to the consumer in time for it to be of use to him in purchasing an automobile.

Therefore, a new Part 582, *Insurance Cost Information*, is added in Chapter V, Title 49, Code of Federal Regulations, to read as set forth below.

*Effective date:* Although the final rule is effective February 1, 1975, as specified in the Cost Savings Act, the dates when automobile dealers will be required to distribute insurance cost information are dependent upon NHTSA progress in developing such information and will be published at a later date in the *Federal Register*.

(Sec. 201(c), P. L. 92-513, 86 Stat. 947 (15 U.S.C. 1941(e)); delegation of authority at 49 CFR 1.51).

Issued on January 31, 1975.

James B. Gregory  
Administrator

**40 F.R. 4918**  
**February 3, 1975**





## PART 582—INSURANCE COST INFORMATION REGULATIONS

**§ 582.1 Scope.** This part requires automobile dealers to make available to prospective purchasers information reflecting differences in insurance costs for different makes and models of passenger motor vehicles based upon differences in damage susceptibility and crashworthiness, pursuant to section 201(e) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1941(e)), herein "the Cost Savings Act."

**§ 582.2 Purpose.** The purpose of this part is to enable prospective purchasers to compare differences in auto insurance costs for the various makes and models of passenger motor vehicles based upon differences in damage susceptibility and crashworthiness, and to realize any savings in collision insurance resulting from differences in damageability, and any savings in medical payment insurance resulting from differences in crashworthiness.

### **§ 582.3 Definitions.**

(a) *Statutory definitions.* All terms used in this part which are defined in section 2 of the Cost Savings Act are used as so defined.

(b) *Definitions used in this part.*

(1) "Automobile dealer" means any person who engages in the retail sale of new or used automobiles as a trade or business.

(2) "Collision insurance" means insurance that reimburses the insured party for physical damage to his property resulting from automobile accidents.

(3) "Insurance cost" means the insurance premium rate, as expressed in appropriate indices, for collision and medical payment, including personal injury protection in no-fault states.

(4) "Medical payment insurance" means insurance that reimburses the insured party for medical expenses sustained by himself, his family, and his passengers in automobile accidents.

### **§ 582.4 Requirements.**

(a) Each automobile dealer shall provide the insurance cost information specified in § 582.5 for examination by prospective purchasers at each location where he offers vehicles for sale.

(b) The information shall be provided without charge and in sufficient quantity to have it available for retention by prospective purchasers, within 30 days after its publication in the *Federal Register*.

(c) The information shall be in English and, if a significant portion of the prospective purchasers do not speak English, in the non-English language most widely spoken by prospective purchasers.

### **§ 582.5 Insurance cost information form.**

The insurance cost information provided pursuant to section 582.4 shall be presented as follows: [Form to be specified].

40 F.R. 4918  
February 3, 1975





## PREAMBLE TO PART 590—MOTOR VEHICLE EMISSIONS INSPECTION CRITERIA

(Docket No. 72-24; Notice 2)

This notice issues a regulation to establish emissions inspection criteria for a diagnostic inspection demonstration projects funded pursuant to the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901, *et seq.*). The regulation is based upon a notice of proposed rulemaking published June 11, 1974 (39 F.R. 20501) and upon comments submitted in response to the notice, and is issued in consultation with the Administrator of the Environmental Protection Agency.

Under Title 15 U.S.C., Section 1962(a), a State may obtain a grant from the Federal government for the purpose of establishing and operating a diagnostic inspection demonstration project. The purpose of the grant program is to explore the feasibility of using diagnostic test devices to conduct diagnostic safety and emission inspection of motor vehicles. The demonstration projects are also designed to help the Federal and State governments determine the best means of structuring safety and emissions inspection programs. Pursuant to the requirements of section 1962(b), this rule establishes emissions inspection criteria to be met by projects funded under this program. The criteria established govern the manner of operation of five Federally-funded State diagnostic inspection demonstration projects to be conducted in Alabama, Arizona, the District of Columbia, Puerto Rico, and Tennessee, and do not, in themselves, impose requirements on any other State or upon any individual.

The subject most commonly discussed in the comments was whether a loaded test mode or a high speed no load test mode would be more effective than the basic idle-only mode inspection procedure in detecting vehicles with very high emission levels and in diagnosing problems. Because this program calls for demonstration projects and is in the nature of a feasibility

study, the NHTSA considers that the most appropriate course is to compare the alternative procedures and, in this way, generate data which may ultimately resolve the question. Accordingly, the States will be allowed to choose between loaded-mode and no-load inspection procedures. For similar reasons no-load inspection procedures will include both low and high speed measurements until such time as the data collected indicates that unloaded high-speed measurements are unwarranted.

Since one of the major purposes of the program is to determine whether this type of inspection is both feasible and cost beneficial, the criteria do not specify that the emission levels be the lowest attainable, but represent a fair balance between low rejection rates which would result in limited program effectiveness and high rejection rates which would result in adverse public reaction. In the event that the actual rejection rate varies significantly from our estimate of approximately 30 percent, the emissions criteria will be modified to bring the rate to the desired level. Because the emission criteria are less stringent than those permitted under the Federal Emission Certification Test criteria, it is not anticipated that conflicting requirements on engine design will result from their application in this program.

Two comments were addressed to the point that the mechanical dynamometer suggested for use in the loaded mode inspection may not simulate normal road loading as well as an electric dynamometer. The purpose of the dynamometer is to provide an adequate load to the engine to allow detection of carburetor main and power circuit malfunctions and ignition misfiring under load. Because this function does not require true road load duplication NHTSA does not consider that the more expensive electric dynamometer should be required.

General Motors Corporation suggested that oxides of nitrogen (NO<sub>x</sub>) measurement be included in the emission inspection criteria. The Environmental Protection Agency recommended waiting until such time as NO<sub>x</sub> controlled vehicles account for a more significant part of the vehicle population in order to make such a program meaningful. NO<sub>x</sub> measuring instruments suitable for this type of inspection have not been developed to a point where low cost, reliable instruments are readily available. Furthermore, tuning a car without NO<sub>x</sub> controls tends to increase the NO<sub>x</sub> emissions slightly while reducing the hydrocarbon and carbon monoxide emissions. Therefore, NHTSA agrees with the EPA that until newer vehicles with NO<sub>x</sub> control devices begin to account for a more substantial part of the overall vehicle population, the level of reduction of emissions of oxides of nitrogen that might be obtained is not large enough to warrant the inclusion of NO<sub>x</sub> inspection at this time.

While the criteria developed in this rulemaking would be appropriate for emissions inspection of light duty trucks and other light duty vehicles, NHTSA has decided not to include these vehicles in the data pool for the demonstration projects. The rule requires that the idle speed of the vehicle at the time of inspection must not be more than 100 rpm greater than that recommended by the manufacturer. The purpose of this requirement is to ensure that

high idle speeds are not masking excessive idle carbon monoxide levels. At the suggestion of the American Motors Corporation the units of measure for proposed emission levels are more specifically identified than in the notice of proposed rulemaking. The unit of measurement of carbon monoxide concentration is Mole percent, while that for hydrocarbon concentration is ppm as hexane.

Therefore, a new Part 590, Motor Vehicle Emission Inspections, is added in Chapter V, Title 49, Code of Federal Regulations. . . .

*Effective date:* This part becomes effective July 5, 1975. The notice of proposed rulemaking had proposed an effective date 30 days after issuance of the final rule. Because the five States that have received grants have all developed their emission inspection in accordance with the proposed criteria, they will not be adversely affected by an immediate effective date. Good cause is accordingly found for an immediate effective date.

(Section 302(b)(1), Pub. L. 92-513, 86 Stat 947, 15 U.S.C. 1901; delegation of authority at 49 CFR 1.51.)

Issued on June 5, 1975.

James B. Gregory  
Administrator

40 F.R. 24904  
June 11, 1975

## PART 590—EMISSION INSPECTIONS

*Sec.*

### 590.1 Scope.

### 590.2 Purpose.

### 590.3 Applicability.

### 590.4 Definitions.

### 590.5 Requirements.

### 590.6 No-load inspection.

### 590.7 Loaded-mode inspection.

### 590.8 Inspection conditions.

#### § 590.1 Scope.

This part specifies standards and procedures for motor vehicle emission inspections by State or State-supervised diagnostic inspection demonstration projects funded under Title III of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901, *et seq.*).

#### § 590. Purpose.

The purpose of this part is to support the development of effective regulation of automobile exhaust emissions and thereby improve air quality, by establishing appropriate uniform procedures for diagnostic emission inspection demonstration projects.

#### § 590.3 Applicability.

This part does not impose requirements on any person. It is intended to be utilized by State diagnostic inspection demonstration projects operating under Title III of the Cost Savings Act for diagnostic emission inspections of passenger cars powered by spark-ignition engines.

#### § 590.4 Definitions.

All terms used in this part that are defined in 49 CFR Part 571, Motor Vehicle Safety Standards, are used as defined in that Part.

#### § 590.5 Requirements.

A diagnostic inspection demonstration project shall test vehicles in accordance with either the no-load inspection criteria specified in section 590.6, or the loaded-mode inspection criteria specified in section 590.7.

#### § 590.6 No-load inspection.

(a) *Criteria.* The vehicle must meet the following criteria when tested by the no-load inspection method.

(1) The vehicle's idle speed, measured with the transmission in the position recommended by the manufacturer for adjusting the idle speed, shall not be more than 100 rpm higher than the idle speed recommended by the manufacturer.

(2) Concentrations of emission samples taken from each exhaust outlet shall not exceed the following levels:

(i) For model years 1967 and earlier: hydrocarbons (HC) 1200 ppm as hexane, and carbon monoxide (CO) 9.0 mole percent.

(ii) For model years 1968 through 1973: HC 600 ppm as hexans, and CO 7.0 mole percent.

(b) *Method.* No-load inspection is conducted by measuring two emission samples from each exhaust outlet. The first emission sample is collected with the vehicle's transmission in neutral and the engine operating at 2250 rpm. The second sample is collected with the vehicle's transmission in the position recommended by the manufacturer for adjusting the idle speed, and the engine idling.

#### § 590.7 Loaded-mode inspection.

(a) *Criteria.* When the loaded-mode inspection is conducted, concentrations of the emission



samples taken from each exhaust outlet for each of the three phases of the driving cycle in Table I, conducted in the sequence indicated, shall not exceed the levels given in Table II. For the purpose of determining the weight classification of a motor vehicle for the loaded-mode inspection, 300 pounds are added to the vehicle's unladen curb weight.

TABLE I

Curb weight plus 300 lbs	Driving cycle (speed-load combination)		
	1st phase high cruise	2d phase low cruiser	3d phase idle
3,801 lbs and up	48 to 50 mi/h at 27 to 30 hp	32 to 35 mi/h at 10 to 12 hp	At idle.
2,801 to 3,800 lbs	44 to 46 mi/h at 21 to 24 hp	29 to 32 mi/h at 8 to 10 hp	Do.
2,000 to 2,800 lbs	36 to 38 mi/h at 13 to 15 hp	22 to 25 mi/h at 4 to 6 hp	Do.

TABLE II

High cruise	Low cruise	Idle
1967 and earlier model years		
HC 900 ppm as hexane	HC 900 ppm as hexane	HC 1,200 ppm as hexane
CO 4.5 mole percent	CO 5.5 mole percent	CO 9.0 mole percent
1968 through 1973		
HC 450 ppm as hexane	HC 450 ppm as hexane	HC 600 ppm as hexane
CO 3.75 mole percent	CO 4.25 mole percent	CO 7.0 mole percent

(b) *Method.* Loaded-mode inspection for the first two phases of the driving cycle described in Table I is conducted by measuring the levels of emission concentrations from each exhaust outlet of a motor vehicle operated on a chassis dynamometer, with the vehicle's transmission in the setting recommended by the vehicle manufacturer for the speed-load combination being tested. For the idle phase, vehicles with automatic transmissions are tested in drive, and vehicles with standard transmissions are tested in neutral.

§ 590.8 Inspection conditions.

- (a) The vehicle engine is at its normal operating temperature, as specified by the vehicle manufacturer.
- (b) An engine speed indicator with a graduated scale from zero to at least 2500 rpm is used for the unloaded inspection procedure.

- (c) The equipment used for analyzing the emission concentration levels—
- (1) Has a warm-up period not to exceed 30 minutes;

(2) Is able to withstand sustained periods of continuous use;

(3) Has a direct and continuous meter readout that allows readings for concentration levels of carbon monoxide (CO) from 0–10 mole percent, and of hydrocarbon (HC from 0–2000 ppm as hexane; and if used for the loaded-mode inspection, has at least one additional expanded direct and continuous readout for concentration levels of carbon monoxide and of hydrocarbon, such as from 0–5 mole percent and from 0–1000 ppm as hexane respectively;

(4) Has an accuracy of better than ±5% of the full scale reading for each concentration range;

(5) Permits a reading for each emission concentration level, within 10 seconds after

the emission sample has been taken, that is not less than 90% of the final reading; and

(6) Has a calibration system using a standard gas, or an equivalent mechanical or elec-

trical calibration system which itself is based on a standard gas.

**40 F.R. 24904**

**June 11, 1975**

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## PREAMBLE TO DEPARTMENT OF THE TREASURY REGULATION RELATING TO IMPORTATION OF MOTOR VEHICLES AND ITEMS OF MOTOR VEHICLE EQUIPMENT

On April 10, 1968, Public Law 90-283 was enacted to amend the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1391-1409) by adding a new section 123. This section provides a procedure whereby the Secretary of Transportation is authorized, upon petition by a manufacturer of 500 or less vehicles annually, to temporarily exempt such vehicles from certain Federal motor vehicle safety standards. The procedures for temporary exemption of such vehicles adopted by the Department, as published in the *Federal Register* on September 26, 1968 (33 F.R. 14457), require each exempted vehicle to bear a label or tag permanently affixed containing certain information including a statement listing the safety standards for which an exemption has been obtained. Since vehicles so exempted will no longer bear the "valid certification as required by section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1403)" which is required by 19 CFR 12.80(b)(1) if a motor vehicle offered for importation is not to be refused entry, it is deemed desirable to amend 19 CFR 12.80(b) to allow entry of exempted vehicles bearing the exemption labels or tags required under the regulations of the Department of Transportation (23 CFR 217.13).

In addition, the Automobile Manufacturer's Association, Inc., on behalf of itself and its member companies, has made a showing of the necessity of importing and using for purposes of test or experiment for a limited time on the public roads, of a limited number of nonconforming motor vehicles manufactured outside the United States. The Association has requested an amendment of 19 CFR 12.80(b)(2)(vii) which currently, among other things, allows the importation of such vehicles for such purposes only upon a declaration by the importer that these vehicles will not be licensed for use on the public roads.

In consideration of the foregoing, § 12.80(b) is amended as follows:

Subparagraph (b)(1) is amended by changing the period following the words "so labelled or tagged", to a comma and (b)(2)(vii) is amended to read as follows:

§ 12.80 Federal Motor vehicle safety standards.

\* \* \* \* \*

(b) \* \* \*

(1) \* \* \* or (iii) (for vehicles only which have been exempted by the Secretary of Transportation from meeting certain safety standards) it bears a label or tag permanently affixed to such vehicle which meets the requirements set forth in the regulations of the Department of Transportation, 23 CFR 217.13.

(2) \* \* \*

(vii) The importer or consignee is importing such vehicle or equipment item solely for the purposes of show, test, experiment, competition, repairs or alterations and that such vehicle or equipment item will not be sold or licensed for use on the public roads: Provided, That vehicles imported solely for purposes of test or experiment may be licensed for use on the public roads for a period not to exceed one year, where such use is an integral part of tests or experiments for which such vehicle is being imported, upon condition that the importer attach to the declaration description of the tests or experiments for which the vehicle is being imported, the period of time during which it is estimated that it will be necessary to test the vehicle on the public roads, and the disposition to be made of the vehicle after completion of the tests or experiments.

\* \* \* \* \*

(Sec. 108, 80 Stat. 722, 15 U.S.C. 1397)

Since the first amendment is necessitated to conform to regulations of the Department of

Effective: December 14, 1968

Transportation presently in effect and the second will affect a very limited number of persons with a legitimate interest in road testing non-conforming vehicles, notice and public procedure thereon is not considered necessary and good cause is found for dispensing with the delayed effective date provision of 5 U.S.C. 553(d). Therefore, the amendments shall be effective upon publication in the *Federal Register*.

[SEAL]

Lester D. Johnson  
Commissioner of Customs

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Approved: November 29, 1968.

Joseph M. Bowman,  
Assistant Secretary  
of the Treasury.

Approved: December 9, 1968.

Lowell K. Bridwell,  
Federal Highway Administrator.

33 F.R. 18577

December 14, 1968

**PREAMBLE TO AMENDMENT TO DEPARTMENT OF THE TREASURY REGULATION RELATING  
TO IMPORTATION OF MOTOR VEHICLES AND ITEMS OF MOTOR VEHICLE EQUIPMENT**

**(T.D. 71-122)**

A notice was published in the *Federal Register* on February 18, 1971 (36 F.R. 3121), that it was proposed to amend § 12.80 of the Customs Regulations (19 CFR 12.80) to make the following substantive changes:

1. To provide that motor vehicles and motor vehicle equipment brought into conformity under bond, shall not be sold or offered for sale until the bond is released;

2. To make clear that the term motor vehicle as used in § 12.80 refers to a motor vehicle as defined in the National Traffic and Motor Vehicle Safety Act of 1966;

3. To require a declaration of conformance accompanied by a statement of the vehicle's original manufacturer as evidence of original compliance;

4. To require that declarations filed under paragraph (c) of § 12.80 be signed by the importer or consignee; and

5. To add a bond requirement for the production of a declaration of original compliance and a declaration of conformity after manufacture.

Interested persons were given an opportunity to submit relevant data, views, or arguments. No comments were received. The amendments as proposed, with minor editorial changes, are hereby adopted as set forth below to become effective 30 days after the date of publication in the *Federal Register*.

Robert V. McIntyre,  
Acting Commissioner of Customs.

APPROVED: April 22, 1971.

Eugene T. Rossides,  
Assistant Secretary of the Treasury.

APPROVED: May 3, 1971.

Douglas W. Toms,  
Acting Administrator, National  
Highway Traffic Safety Administration.

36 F.R. 8667  
May 11, 1971





## DEPARTMENT OF THE TREASURY REGULATION RELATING TO IMPORTATION OF MOTOR VEHICLES AND ITEMS OF MOTOR VEHICLE EQUIPMENT

Notice of a proposal to add § 12.80 to Part 12 of the Customs Regulations to prescribe regulations providing for the admission or refusal of motor vehicles or items of motor vehicle equipment which are offered for importation into the United States and which are subject to Federal motor vehicle safety standards promulgated by the Department of Transportation in 49 CFR Part 571, pursuant to the provisions of the National Traffic and Motor Vehicle Safety Act of 1966, was published in the *Federal Register* for November 30, 1967 (32 F.R. 16432). Interested persons were given an opportunity to submit relevant data, views, or arguments in writing regarding the proposed regulations. All comments received have been carefully considered.

In response to those comments, in addition to several minor changes, the first paragraph of § 12.80(b) has been amended to provide for the entry, without written declaration, of motor vehicles and items of motor vehicle equipment intended for export and so labeled. A new provision is also added (§ 12.80(b) (2) (iv)) to provide for the entry, upon written declaration, of new vehicles intended for resale which do not fully conform to the safety standards because of the absence of readily attachable equipment items:

*Provided*, That the importer or consignee undertakes to attach the missing items before such vehicles are offered to the general public for sale. Finally, the importation of nonconforming vehicles for competition purposes will be permitted under § 12.80(b) (2) (vii) if the vehicle will not be licensed for use on the public roads.

Part 12 is accordingly amended to add a new centerhead and section as follows:

Motor Vehicles and Motor Vehicle Equipment  
Manufactured on or after January 1, 1968

### § 12.80 Federal motor vehicle safety standards.

(1) *Standards prescribed by the Department of Transportation.* Motor vehicles and motor vehicle equipment manufactured on or after January 1, 1968, offered for sale, or introduction or delivery for introduction in interstate commerce, or importation into the United States are subject to Federal Motor Vehicle Safety Standards (hereafter referred to in this section as "safety standards") prescribed by the Secretary of Transportation under sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966. (15 U.S.C. 1392, 1407) as set forth in regulations in 49 CFR Part 571. A motor vehicle hereafter referred to in this section as "vehicle" or item of motor vehicle equipment (hereafter referred to in this section as "equipment item"), manufactured on or after January 1, 1968, is not permitted entry into the United States unless (with certain exceptions set forth in paragraph (b) of this section) it is in conformity with applicable safety standards in effect at the time the vehicle or equipment item was manufactured.

#### (b) *Requirements for entry and release.*

(1) Any vehicle or equipment item offered for importation into the customs territory of the United States shall not be refused entry under this section if (i) it bears a certification label affixed by its original manufacturer in accordance with section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1403) and regulations issued thereunder by the Secretary of Transportation (49 CFR Part 567) (in the case of a vehicle, in the form of a label or tag permanently affixed to such vehicle or in the case of an equipment item, in the form of a label or tag on such item or on the outside of a container in which such item is delivered), or (ii) it is intended solely for export, such vehicle or equipment

item and the outside of its container, if any, to be so labeled and tagged, or (iii) (for vehicles only which have been exempted by the Secretary of Transportation from meeting certain safety standards) it bears a label or tag permanently affixed to such vehicle which meets the requirements set forth in the regulations of the Department of Transportation, 49 CFR 555.13.

(2) Any such vehicle or equipment item not bearing such certification or export label shall be refused entry unless there is filed with the entry, in duplicate, a declaration signed by the importer or consignee which states that:

(i) Such vehicle or equipment item was manufactured on a date when there were no applicable safety standards in force, a verbal declaration being acceptable at the option of the district director of customs for vehicles entering at the Canadian and Mexican borders; or

(ii) Such vehicle or equipment item was not manufactured in conformity with applicable safety standards but has since been brought into conformity, such declaration to be accompanied by the statement of the manufacturer, contractor, or other person who has brought such vehicle or equipment item into conformity which describes the nature and extent of the work performed; or

(iii) Such vehicle or equipment item does not conform with applicable safety standards, but that the importer or consignee will bring such vehicle or equipment item into conformity with such safety standards, and that such vehicle or equipment item will not be sold or offered for sale until the bond (required by paragraph (c) of this section) shall have been released; or

(iv) Such vehicle is a new vehicle being imported for purposes of resale which does not presently conform to all applicable safety standards because readily attachable equipment items are not attached, but that there is affixed to its windshield a label stating the safety standard with which and the manner in which such vehicle does not conform and

that the vehicle will be brought into conformity by attachment of such equipment items before it will be offered for sale to the first purchaser for purposes other than resale; or

(v) The importer or consignee is a non-resident of the United States, importing such vehicle or equipment item primarily for personal use or for the purpose of making repairs or alterations to the vehicle or equipment item, for a period not exceeding 1 year from the date of entry, and that he will not resell it in the United States during that time: PROVIDED, That persons regularly entering the United States by a motor vehicle at the Canadian and Mexican borders may apply to the district director of customs for an appropriate means of identification to be affixed to such vehicle which will serve in place of the declaration required by this paragraph; or

(vi) The importer or consignee is a member of the armed forces of a foreign country on assignment in the United States, or is a member of the Secretariat of a public international organization so designated pursuant to 59 Stat. 669 on assignment in the United States, or is a member of the personnel of a foreign government on assignment in the United States who comes within the class of persons for whom free entry of motor vehicles has been authorized by the Department of State and that he is importing such vehicle or equipment item for purposes other than resale; or

(vii) The importer or consignee is importing such vehicle or equipment item solely for the purpose of show, test, experiment, competition, repairs or alterations and that such vehicle or equipment item will not be sold or licensed for use on the public roads: PROVIDED: That vehicles imported solely for purposes of test or experiment may be licensed for use on the public roads for a period not to exceed one year, where such use is an integral part of tests or experiments for which such vehicle is being imported, upon condition that the importer attach to the declaration a description of the tests or experiments for which the ve-



hicle is being imported, the period of time during which it is estimated that it will be necessary to test the vehicle on the public roads, and the disposition to be made of the vehicle after completion of the tests or experiments.

(viii) Such vehicle which is not manufactured primarily for use on the public roads is not a "motor vehicle" as defined in section 102 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1391); or

(ix) Such vehicle was manufactured in conformity with applicable safety standards, such declaration to be accompanied by a statement of the vehicle's original manufacturer as evidence of original compliance.

(3) Any declaration given under this section (except an oral declaration accepted at the option of the district director of customs under subparagraph (2)(i) of this paragraph) shall state the name and United States address of the importer or consignee, the date and the entry number, a description of any equipment item, the make and model, engine serial, and body serial numbers of any vehicle or other identification numbers, and the city and State in which it is to be registered and principally located if known, and shall be signed by the importer or consignee. The district director of customs shall immediately forward the original of such declaration to the National Highway Traffic Safety Administration of the Department of Transportation.

(c) *Release under bond.* If a declaration filed in accordance with paragraph (b) of this section states that the entry is being made under circumstances described in paragraph (b)(2)(iii), or under circumstances described in paragraph (b)(2)(ii) or (ix) of this section where the importer at time of entry does not submit a statement in support of his declaration of conformity the entry shall be accepted only if the importer gives a bond on Customs Forms 7551, 7553, or 7595 for the production of either a statement by the importer or consignee that the vehicle or equipment item described in the declaration filed by the importer has been brought into conformity with applicable safety stand-

ards and identifying the manufacturer, contractor, or other person who has brought such vehicle or equipment item into conformity with such standards and describing the nature and extent of the work performed or a statement of the vehicle manufacturer certifying original conformity. The bond shall be in the amount required under § 25.4(a) of this chapter. Within 90 days after such entry, or such additional period as the district director of customs may allow for good cause shown, the importer or consignee shall deliver to both the district director of customs, and the National Highway Traffic Safety Administration a copy of the statement described in this paragraph. If such statement is not delivered to the district director of customs for the port of entry of such vehicle or equipment item within 90 days of the date of entry or such additional period as may have been allowed by the district director of customs for good cause shown, the importer or consignee shall deliver or cause to be delivered to the district director of customs those vehicles or equipment items, which were released in accordance with this paragraph. In the event that any such vehicle or equipment item is not redelivered within 5 days following the date specified in the preceding sentence, liquidated damages shall be assessed in the full amount of a bond given on Form 7551. When the transaction has been charged against a bond given on Form 7553, or 7595, liquidated damages shall be assessed in the amount that would have been demanded under the preceding sentence if the merchandise had been released under a bond given on Form 7551.

(d) *Merchandise refused entry.* If a vehicle or equipment item is denied entry under the provisions of paragraph (b) of this section, the district director of customs shall refuse to release the merchandise for entry into the United States and shall issue a notice of such refusal to the importer or consignee.

(e) *Disposition of merchandise refused entry into the United States; redelivered merchandise.* Vehicles or equipment items which are denied entry under paragraph (b) of this section or which are redelivered in accordance with paragraph (c) of this section and which are not ex-

ported under customs supervision within 90 days from the date of notice of refusal of admission or date of redelivery shall be disposed of under customs laws and regulations; *Provided, however*, That any such disposition shall not result in an introduction into the United States of a vehicle or equipment item in violation of the National Traffic and Motor Vehicle Safety Act of 1966.

(Sec. 623, 46 Stat. 759, as amended, sec. 108, 80 Stat. 722; 19 U.S.C. 1623; 15 U.S.C. 1397)

Since motor vehicles and items of motor vehicle equipment subject to the standards prescribed in 49 CFR Part 571, may shortly be in transit to United States ports of entry, it is important that these regulations be put into effect at the earliest possible date. It is therefore found that the ad-

vance publication requirement under 5 U.S.C. 553 is impracticable and good cause is found for adopting these regulations effective upon publication in the *Federal Register*.

(SEAL)

Lester D. Johnson  
Commissioner of Customs

APPROVED: January 2, 1968.

Matthew J. Marks,  
Acting Assistant Secretary  
of the Treasury

APPROVED: January 5, 1968.

Alan S. Boyd  
Secretary of Transportation

**33 F.R. 360**  
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M.V. IMPORT-4





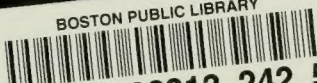








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